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THIS MONTH'S COVER

Ennore, about 10 miles north of Madras, which has been a fine picnic spot, is now fast developing into a huge industrial complex. An express way has been constructed from the port to Ennore to cope up with the traffic, which will increase in the near future. Already Ennore is served by a double track broad guage railway line. Trains moving over the double track railway bridge near Ennore in silhouette present an arresting picture. It is also a prominent fishing centre, where an angler will have a good past-time.

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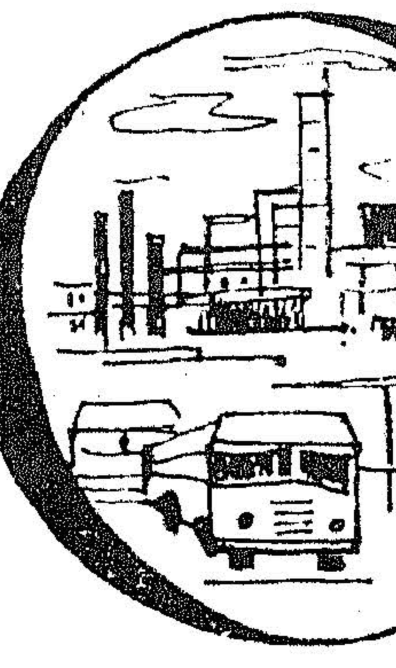
FAST DEVELOPING ENNORE



In his last budget speech on 1st March, the Chief Minister of Madras stated that Madras is among the few States of India which have recorded a steady progress in industrial development and in fulfilling what was expected of them in regard to mobilization of resources. This satisfactory performance was rendered possible because we have in the last decade built up a sound techno-administrative machinery fully geared to the tasks of development. The Planning Commission which made an assessment of the Third Plan in the State, some time back, has recorded its high appreciation of our efforts and the progress we have been able to register in all key sectors of growth like agriculture, power, industries and transport.

The textile industry was the only fairly developed industry worth mentioning at the beginning of the First Plan period. After Independence, several industries ranging from consumer goods industries to capital goods industries—big and small—have come up both in public as well as in private sectors. We have during the last two plan periods built up a broad-based industrial complex and have also achieved a fair dispersal of industries in different parts of the State.

Picnic spot

Madras City itself has now out grown in size and stature. A ring of industrial belt is now encircling her. Several industrial hamlets have come up. There is Guindy Industrial Estate and Ambathur and Avadi are also fast developing. Ennore is not an exception to this. Ennore hitherto a fine picnic spot about ten miles north of Madras on the shore of the Bay of Bengal and on the Madras-Calcutta railway line is now fast developing into an industrial hamlet.

This small village with its enchanting surroundings has served as a fine picnic spot in the British period. During the pre-independent days, Europeans used to go there to spend their holidays. Still there are several bungalows which were built for their stay on the strip of the land between the sea and the backwaters. The sand expanse of the coast at this point covers an area of about 20,000 acres.

Ennore is a prominent fishing centre where an angler can have much delight. There is a marine biological station at Ennore which carry out fisheries research work. Other such stations are at Krusadai Island, Tuticorin and Cape Comorin. The biological station at Ennore also supplies biological specimens to colleges, universities and private institutions throughout the country. Preliminary action is also being taken for building up Freezing Unit at Ennore, during 1965–66.

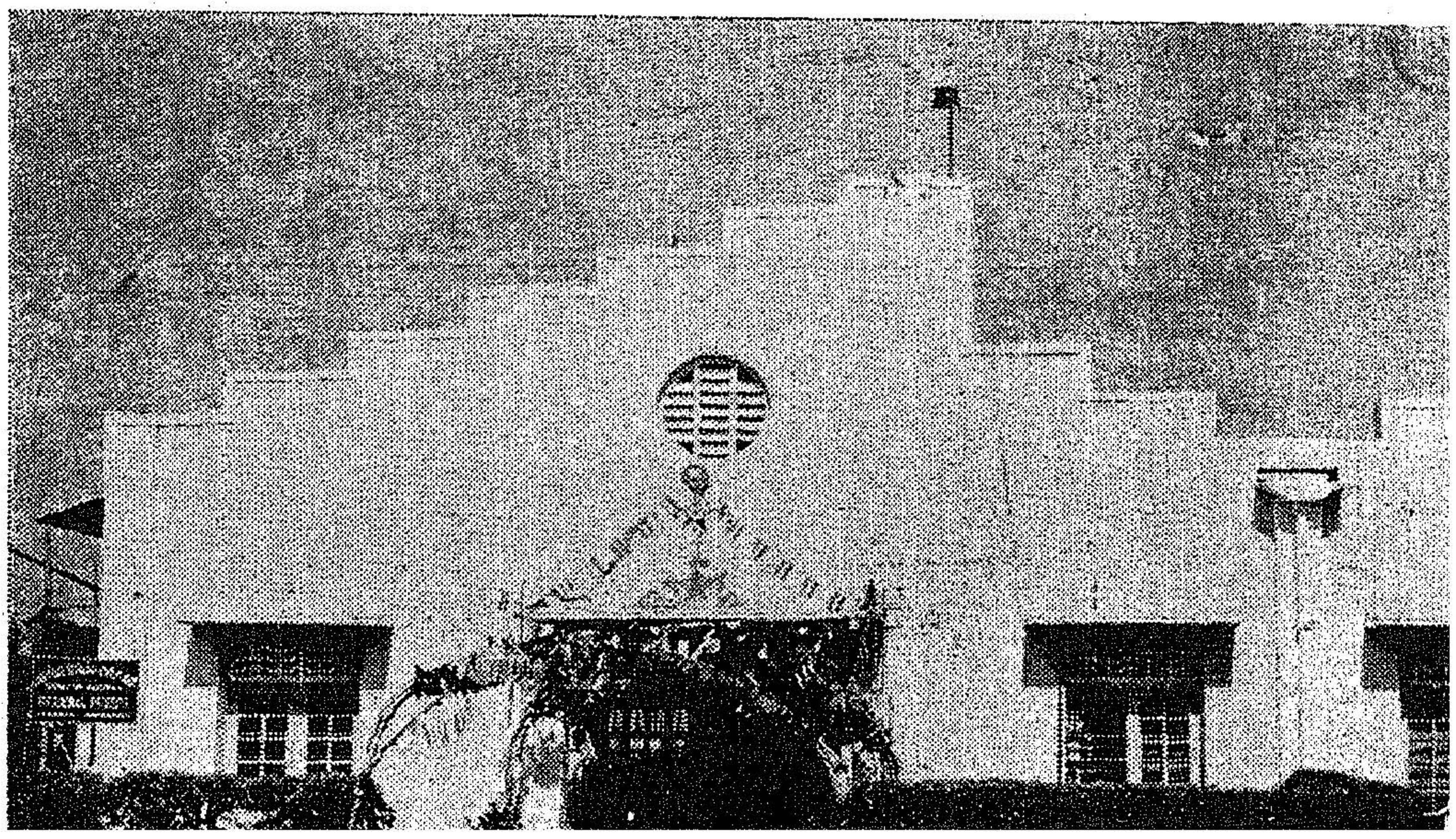
Much of the inland-navigation trade of Madras City passes through the Buckingham Canal which passes by the side of this village. It is a pleasant sight to see several groups of boats passing through the P.W.D. lock of the canal, built about a century ago, throughout the day.

Power station

Everywhere new buildings are now springing up. The whole surrounding is full of life bustling with activities. Besides its traditional occupation of salt manufacture on a big scale, which brought fame to this place during the Salt Satyagraha Movement, several new factories are coming up. Asok Leyland, Ennore Foundries and Fertiliser factory in the private sector have already been established.

The fair measure of success we have achieved in expansion and diversification of industries depends not a little on the energetic implementation of power programmes. As against the Third Plan target of

Front view of the Government Regional Press, Tiruchirappalli, which was recently inaugurated by the Chief Minister.



1,040 MW of power, the Madras State Electricity Board will have an installed capacity of 1,150 MW. With the 400 MW of power to be commissioned at Neyveli the installed capacity in the State will be 1,550 MW as against only 571 MW at the commencement of the Third Plan. Keeping in view the need to maintain a proper balance between hydel and thermal power, we have already got clearance from the Planning Commission for setting up a thermal station with a capacity of 300 MW at Ennore. When completed it will be the third thermal power station in the State, Basin Bridge and Neyveli power stations being the other two. With its completion the Ennore thermal power station will go a long way in easing the power crisis of the industries around Madras.

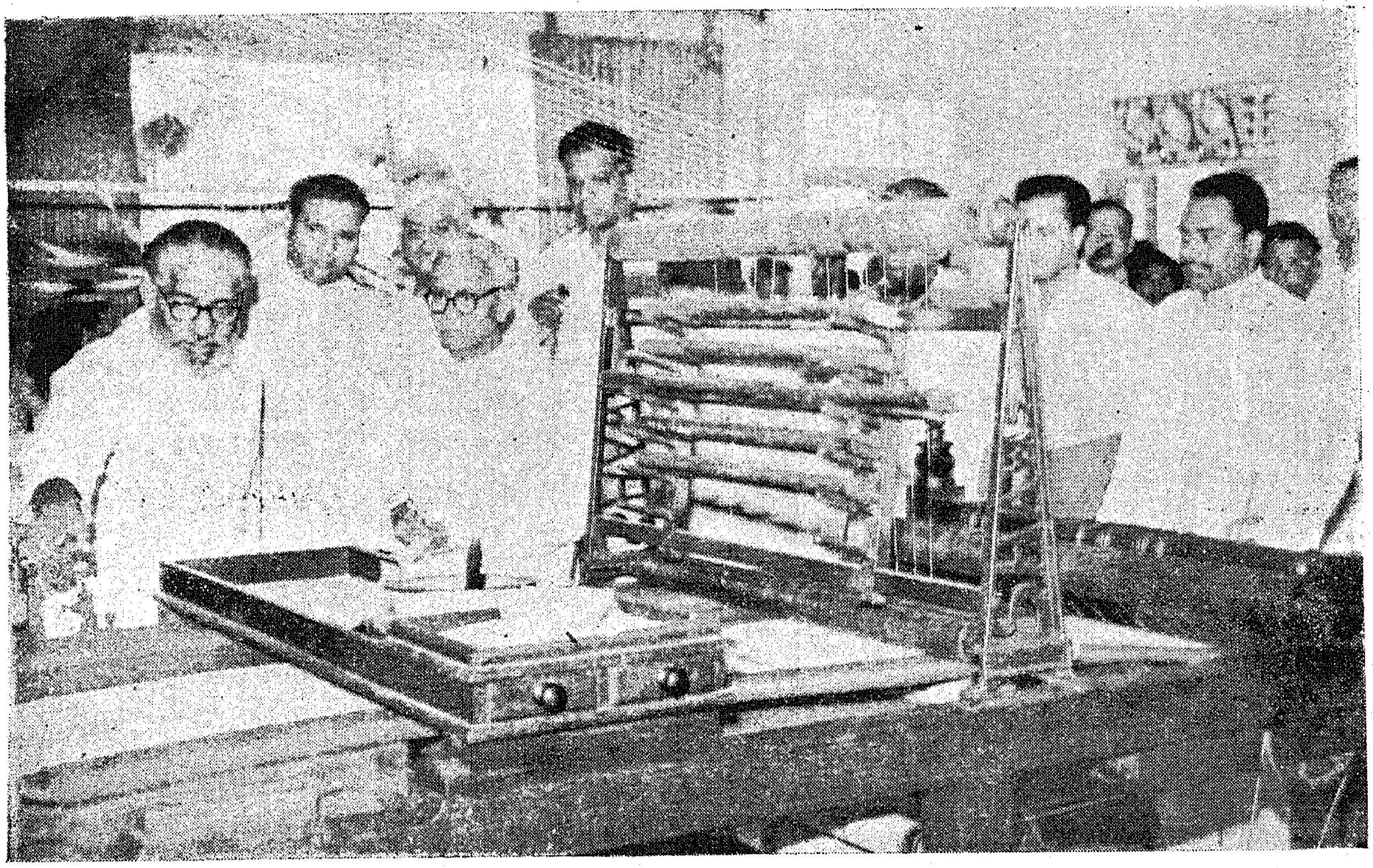
Oil-Refinery

The Government of India also decided to locate a Petroleum Refinery at Ennore with a capacity of 2·5 million tonnes of crude and a fertilizer factory with a capacity of 200,000 tonnes of nitrogen per year. Lands for these projects are under acquisition and the State Government are now doing preliminary investigation for the provision of various facilities like water, railway siding, road, etc.

The site for the Petroleum Refinery will be a 3,000 acre strech of palm-dotted land lying beyond the Ennore backwaters. It is part of Manali village and is hemmed in on the south by the Buckingham Canal and on the north by the surplus channel of the Red Hills lake. In a few years this stretch of partly barren land will be transformed into a huge industrial complex. On it will rise besides the Rs. 20 crores refinery, the country's biggest fertilizer plant costing about Rs. 30 crores and other Petro-chemical units. Construction work of the refinery will start towards the end of this year and is expected to start production by the end of 1967. The fertilizer factory will take longer time. As regards the Petro-chemical units the proposal is to set up at first two factories to manufacture PVC and methanol and are still in preliminary stage. An American Oil Company will supply and help to erect the refinery plant. An Iranian Company will supply part of the 2·5 million tonnes of crude that the refinery will process each year. Each company will have 13 per cent share of the company's capital.

A good road to transport heavy equipment that comes by ship to the project will have to be built. The plan is to use the express way from the port to Ennore. A three mile long road will be built to the site with a bridge across the Buckingham Canal and a flyover across the rail track. Parallel to this route will be laid a 30-inch pipe that will carry crude to the refinery from the port. This line will cover a distance of ten miles.

Thus in a few years Ennore will be transformed into a huge industrial complex.



Chief Minister who inaugurated the Government Regional Press at Tiruchy is going round the Press.

Canada Power house III of KUNDAH PROJECT

The Kundah Hydro-Electric Scheme which derives the name from the river Kundah in the Nilgiris is the biggest Hydro-Electric Scheme so far undertaken in Madras State. In token of appreciation and grateful gesture of the assistance received from Canada for the project, all the five power houses of the scheme are named after Canada as Canada Power House I, II, etc. Canada Power Houses, 1, 2 *and* 5 *are already in operation. Canada Power House-*3 *was recently inaugurated by the Chief Minister of Madras.*

The river Kundah has long been recognised as one of the greatest sources of water power in the Nilgiris ranges. Situated in the Western catchments, the river takes shape from its main tributaries Emerald and Avalanche which rise amidst a group of high peaks of over 8,000 feet in altitude, joined by various streams lower down and finally confluences with Bhavani River at an altitude of 1,300 feet. The Kundah Hydro-Electric Scheme is intended to harness the waters of the Kundha river in two phases for the generation of power in five power houses with an installed capacity of 425 MW. Both the phases of the project, received generous aid from the Government of Canada under the Colombo Plan to the tune of 43 million dollars. In token of appreciation and grateful gesture of the assistance received from Canada, all the five power houses of the Scheme are named after Canada. The Canada Power House 3 will have an installed capacity of 120 MW of which the first 60 MW unit has been inaugurated by Sri M. Bhakavatsalam, Chief Minister, recently. This is the fourth power station of the Kundah Hydro-Electric Scheme and the ninth Hydro-Electric Power Station to be added to the Madras Grid. The fifth power house of the scheme, viz., Canada Power House 4 with an installed capacity of a single 50 MW unit, is in an advanced stage of construction and is expected to be commissioned shortly.

The initial phase of the Kundah Hydro-Electric Scheme included in the Second Five-Year Plan was estimated to cost Rs. 354 millions. It provided for the construction of four masonry dams, viz., Upper Bhavani, Avalanche, Emerald and Kundah dams, three tunnels of 8 miles length in rock, 27,500 feet of penstock pipes and two power houses, viz., Canada Power House 1 at Kundah with two generating units of 20 MW each and Canada Power House 2 with four units of 35 MW each. Canadian assistance to the initial phase of the scheme amounted to about 21 million dollars by way of plant and machinery which included gates for the dams, low pressure pipe lines, penstock pipes, valves, generating machinery, steel structures, oil circuit breakers and associated equipment besides material for the 110 and 230 KV transmission lines and equipments for the sub-stations at Thudiyalur, Salem and Koratur. The initial phase of the scheme was inaugurated on the 29th June 1956. The works connected with Canada Power House 1 were completed in a record time of three and a half years and the power house was commissioned into operation in the presence of the then Prime Minister of India, Sri Jawaharlal Nehru, in March 1960. By June 1961 the entire capacity of 180 MW envisaged under the initial phase of the scheme in Canada Power Houses 1 and 2 was in operation.

The total fal in the Kundah River that would be available for power generation is about 6,515 feet of which 3,650 feet was utilized in the initial phase. A scheme for further extensions to the initial phase, utilizing the balance 3,865 feet of head in the Kundah river, was taken up for execution under the Third Five-Year Plan at an estimated cost of Rs.230 millions. The scheme envisages two more power stations down below the Kundah river and another Power House —Canada Power House 5—at the exit of Upper Bhavani Tunnel and additional generators in Canada Power Houses 1 and 2. Canadian assistance to the extension Scheme under the Colombo Plan is about 22 million dollars.

Under the extension scheme, an additional 20 MW unit at Canada Power House 1, an additional 35 MW unit at Canada Power House 2 and the Canada Power House 5 with a 20 MW unit have been commissioned in March, February and October 1964 respectively. The transmission lines and extensions to sub-stations have also been completed. The Kundah Hydro-Electric Scheme is thus operating now with an installed capacity of 255 MW of the three power stations.

Location

Canada Power House 3 is located at Pulikkarai-pallam Valley in the reserve forest area of the Coimbatore district, about 25 miles from Karamadai. The discharge water from the tail race of the Canada Power House 2 will be impounded by a 182 feet high masonry dam built across the Pegumbahalla stream and conducted through a horse-shoe shape tunnel seven miles long and thence through two penstocks each 3,534 feet long to Canada Power House 3 equiped with two 60 MW vertical impulse turbine sets.

Situated at an elevation of 1,429 feet above M.S.L. the Power House building 222 feet long, 79 feet wide and 49 feet high, is of structural steel frame work with stone masonry walls built to accommodate three generating units ultimately.

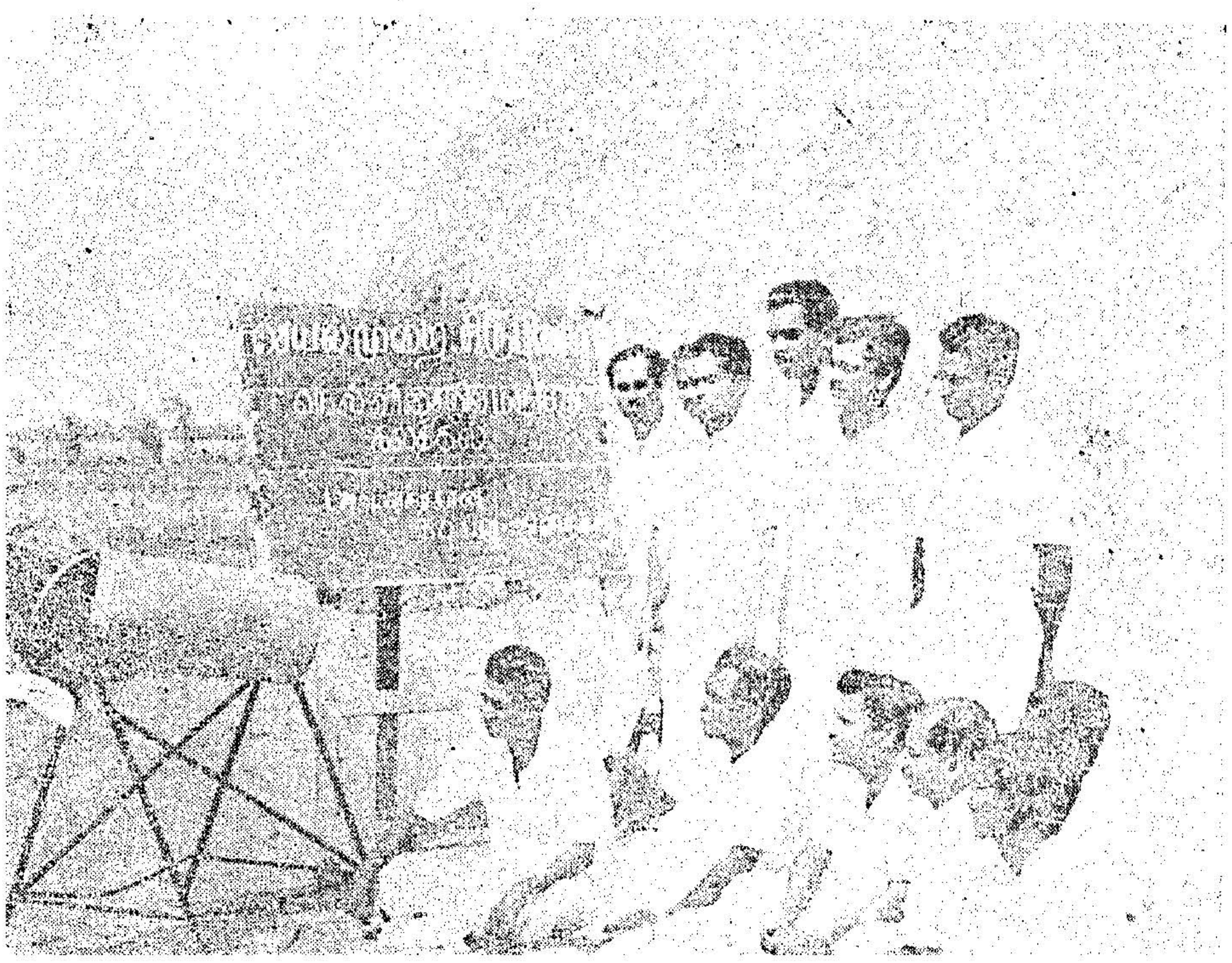
The site chosen for the power house based on hydraulic condition, required extensive excavation of about 154 feet depth on all sides which can be said to be one of the deepest so far done in India. The total excavation involved for locating the power house building is about 7·5 Mc. feet out of which 4·3 Mc. feet was in hard rock. Due to good hard rock available no special treatment for foundations was made.

The two turbines installed are of vertical impulse turbines type with 6 jets, rates to develop 86,000 H.P. at a net head of 1,350 feet and a speed of 333·3 R.P.M. The runner supplied for the turbine is 13 tons, of 12·5 per cent chrome stainless steel. Each of the two turbines are coupled individually to a 67,500 K.V.A., 11 KV, 18 poles, 0·9 pf. vertical suspension type generators, having the combined thrust and guide bearing on the top bracket. For the first time in the gird, generators with only one guide bearing are being used. The startors for the generators were received in two sections partially wound in the factory itself, each section weighing nearly 43 tons.

The generator terminal cubicles, the neutral excitation and voltage regulators cubicles, are all arranged on either side of the respective generators. The relay panels, control desk, L.T., A.C. and D.C. panels have all been erected on the machine hall floor itself, resulting in appreciable savings in the power house building and superstructure. A 220 V. 270 Ah. lead acid battery, has been installed in a separate room on the machine floor.

Three turbine pumps of 1,200 G.P.M. capacity have been installed in the turbine needle floor for supplying the cooling water to the generator air coolers and the bearings of turbines and generators. Separate Booster pumps (3 numbers of 110 G.P.M. capacity) have been provided in the same floor, for handling the cooling water supply of the transformers located in the outdoor yard.

Grama Sevaks are being given intensive training at the Rural Extension Training Centre, Pattukottai which was inaugurated recently by the Chief Minister.



The power generated will be directly stepped from 11 KV to 230 KV by means of two banks of transformers each bank consisting of 3 numbers 22·5 MVA single phase 11/230 KV transformers located in the outdoor yard. The transformers are of water cooled oil forced type (OPW). For the first time in the Madras Grid such direct step up from 11 KV to 230 KV has been adopted here.

The 11 KV cables used for connecting the generator terminals and the transformer are of special Ozone treated Butyl Rubber insulation being used for the first time in the Grid.

Remote Control operation

The outdoor transformer yard is located at a higher level of 107 feet above the machine hall floor (at an elevation of 1,536) thereby avoiding excavation. The structures are of galvanised steel. Six 22·5 MVA 11/230 KV transformers have been erected to step up the generated power for transmission to Thudiyalur via Canada Power House 4 and Canada Power House 2. Two 230 KV single circuit lines one to Canada Power House 4 and the other to Canada Power House 2 take off, from this yard.

Supervisory and telemetering equipments have been installed for the remote operation of this power house over Power line carrier from Canada Power House 2 which is situated 15 miles away. Canada Power House 2 will be the master station from where all the other 4 stations would be remotely controlled, and important values telemetered over power line carrier. Remote operation is expected to result in better co-ordination besides appreciable savings in the operation and maintenance costs.

Power Line Carrier Communication equipments have also been installed in the power house for effective communication.

The tail race water of Canada Power House 3 is led into the Pillur Reservoir across the river Bhavani through a 3,660 feet long channel in deep cutting. The width of the channel is 20 feet with a bed fall of 1 in 350 for distance of 2,200 feet length from the power house and 35 feet with a bed fall of 1 in 500 for the rest of the length, the average depth of cutting being 60 feet. The total quantity of excavation for this tail race channel was about 12,000 units out of which 5,000 units were of hard rock.

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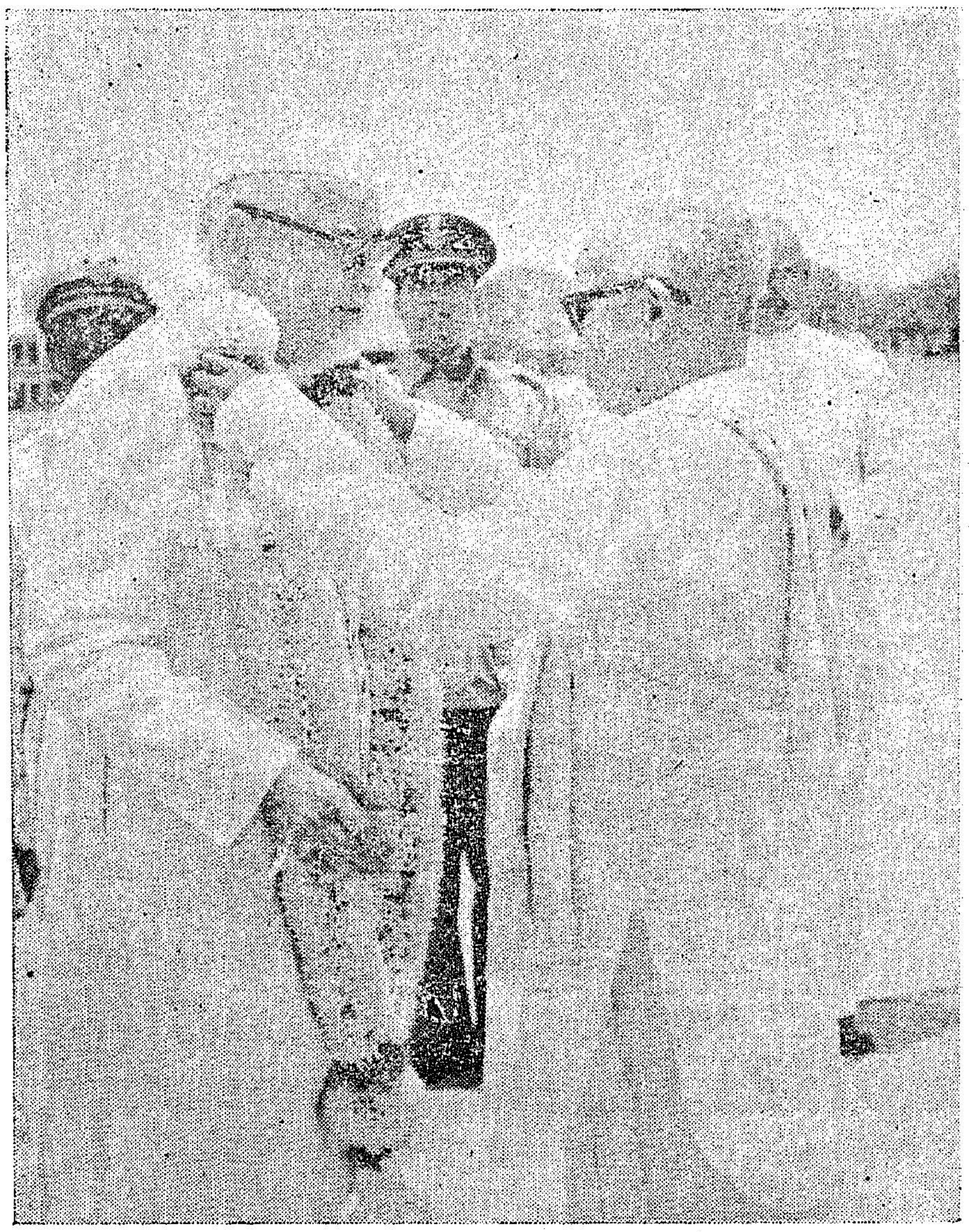


Chief Minister receiving the Vice-President of India Dr. Zakir Hussain who paid a visit recently to the State.

An outstanding work

The Kundah Hydro-Electric Project has been recognised as an outstanding work and its overall design and technical excellence have already been commented upon in Engineering Circles. Canada Power House 3 completed just in four years time stands as a living example of Indo-Canadian Friendship and Co-operation and is yet another symbol of the beneficial nature of the Colombo Plan. This power station equipped with the biggest generating units so far installed in the Grid, is an important land mark in the history of Power Generation in the State. Its water conductor system, employs the longest tunnel in Asia, the deepest sugar tank in India and the largest size of penstock and valve in the State. With the commissioning of the first 60 MW set now and followed by the second unit by about July next, the installed capacity in the Madras Grid will increase by another 120 MW. The Kundah Hydro-Electric Project on completion of Canada Power House 4 also, will have a total installed capacity of 425 MW and would help to accelerate the Industrial and Agricultural development of the State.

NEERA CURES EYE DISEASES

It is an established fact that Neera contains vitamins. It is commonly consumed by the rich as well as the poor in rural and urban areas.

Dr. G. Venkataswamy, M.S.D.O., Professor of Ophthalmology, Madurai Medical College, Madurai, treated patients with Neera. This experiment is being continued. The Madras State Palmgur Co-operative Federation has sanctioned a sum of Rs. 5,000 *towards the experiment. After conducting the experiment Dr. G. Venkataswamy has come to the following conclusions :*

"Identical groups of cases were selected for the purpose of treatment with **Pathaneer** *and the Riboflavin deficiency of vitamin B-2. Both groups were similar in age, sex, income, occupation and clinical science and symptoms. After treatment it was found* **Pathaneer** *was as good as Riboflavin in the treatment of Aribovlavinosis.* **Pathaneer** *cured the condition more or less in the same duration of Riboflavin.*

"In the villages where Neera is produced, diseases due to vitamin B deficiency could be easily treated by it. The Neera is easily available during a particular season. It is cheap, and liked by all. Daily consumption will prevent vitamin deficiency diseases. Consumption of Neera will promote the Cottage Industry in one side and improve the health of the villagers in the other side ".

The Madras State Palmgur Co-operative Federation has taken part in the exhibition held at the Centenary Hall of the Madras University from 6th *to* 9th *January* 1965 *at the time of All - India Opthalmological Conference. Neera, Candy, Palm Sugar, Palm molasses, Palm Vinegar and Palmgur prepared by the Federation were displayed. The photos of the patients who were treated with neera were displayed. They attracted the doctors who came from all over India. Fresh chilled Neera was distributed to all the doctors by the State Palmgur Federation daily. Doctors who treated Neera have recorded their impressions.*

The nutritive contents of **Pathaneer**, *Palmgur, Palm sugar were attractively displayed by the State Federation so as to convince the medical professionist that* **Pathaneer** *is a natural nutritious drink. Dr. G. Venkataswamy, who was incharge of the Exhibition displayed charts describing the experiments and conclusions. In this connection, the Madras State Palmgur Co-operative Federation has published a brochure (viz.), (1) Palmgur Industry—Research, (2) Research on Palmgur with scientific datas, analytical reports, articles from eminent scientists who have worked on Neera. The exhibits and results of the experiment conducted at the various Universities, convinced them that Neera is playing an important role in the consumption schedule of public. It is expected that Neera will shortly find a place in the list of prescriptions of the doctors.*

The Madras State Palmgur Co-operative Federation sold frozen neera through the exhibition stall, during the All-India Congress Exhibition held at Madras from 23rd *December* 1964 *to* 4th *February* 1965. *The frozen neera tastes good as processed by the Bharatiya Tad Gud Shilpa Bhavan, Dahanu. The high alkality contents of the neera added by Madras tapping artisans seems to be reduced into mild quality and taste, flavour, sweetness is maintained. People who consumed this neera appreciated very much.*

Sholinghur

A. K. VENKATESAN

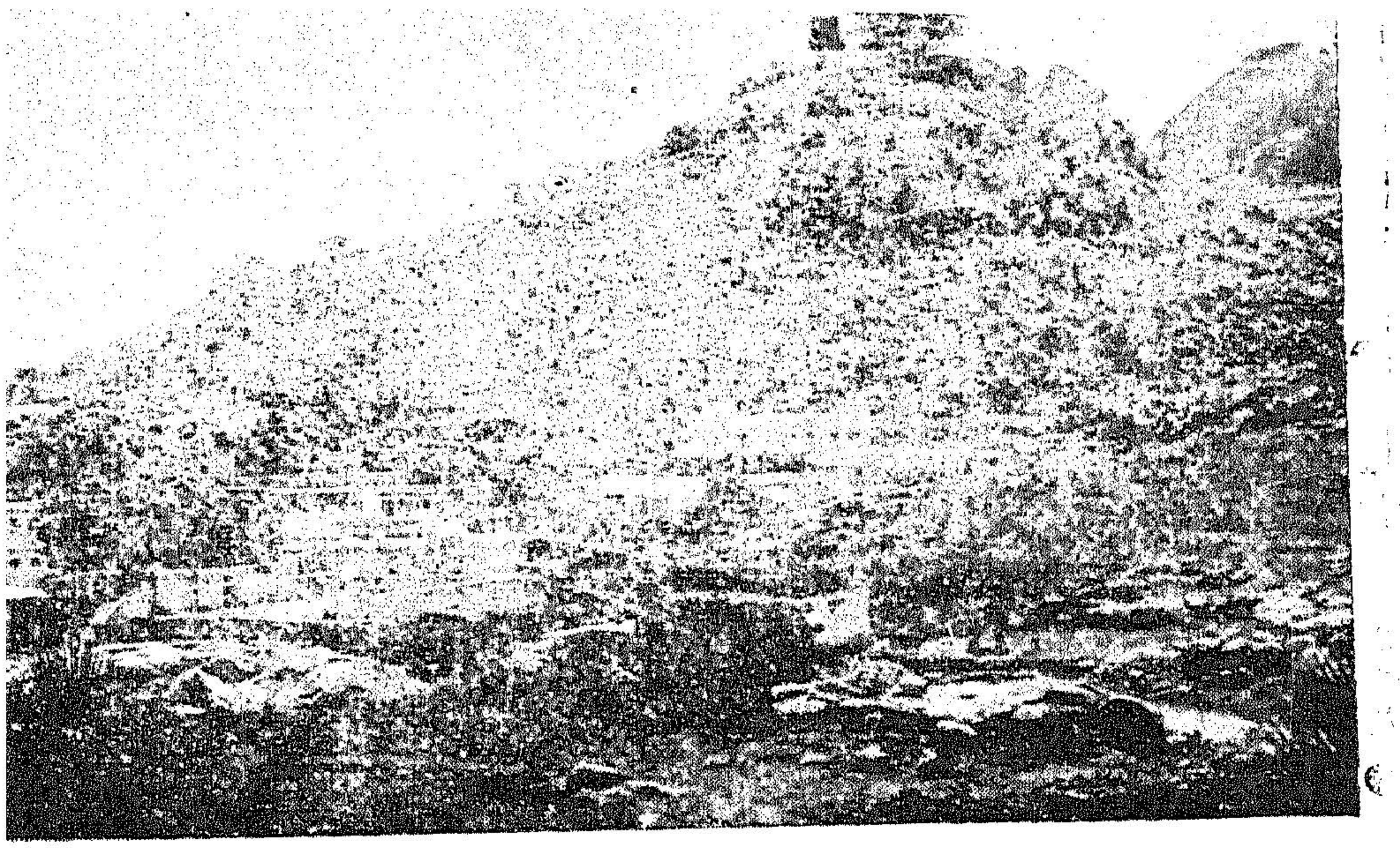
Sholinghur is a town of historical as well as tourists importance. It is one of the 108 Tirupathis (holy places) of Vaishnavism. It is here the Hyder Ali of Mysore fought against the East India Company. Sholinghur is situated on the Northern border of Mdras State in the North Arcot district midway between Tirupathi and Kancheepuram.

The temple of Sri Yoga Narasingha with his consort Goddess Amruthapalavalli is situated on the higher hill in Sholinghur and the temple of Sri Anjaneya on the lower hills.

As you travel by rail from Madras to Jalarpet, soon after leaving Madras, wo land marks catch the eye by their prominence on the range of hills to the north-west which form spurs of the Eastern Ghats. The first and more prominent one is the Nagalapuram-Nagari range culminating in the unmistakable "Nagari Nose" rising some 2,800 feet above sea level. The jsecond is the Sholinghur range to the west of Arkonam.

The countryside around Sholinghur is rocky, with ungle and shrub-covered hills and bold rugged tors. At first sight, it looks barren and unpromising but as you move northward from the railway, you find the landscape becoming picturesque. The valleys and jungles, particularly after rains, look green and pleasing while the hill ranges criss-crossing the country and scattered masses of boulders look like playthings of titans strewn about in some whimsical fit. Here and there on the undulating terrain spread numerous lakes and watersheds, some of them fairly large like the Minnal, Kodakal and Sholinghur lakes. Paddy fields and groves extend around the lakes presenting lovely patterns of colour. Forests in this region have suffered terribly in recent decades and efforts at rehabilitation have yet to make an impression. Still the region can hold its claim to being one of the most picturesque parts of North Arcot district and deserve Innes Munro's 180 year old tribute to the area as "one of incomparable beauty". The crowning

A view of Sri Narasingha Temple on the Sholinghur Hill. The steep cliffs and gorges provide thrills to the seeker of adventure.



The Lower Hill with Sri Anjaneya Temple and Kondapalayam Village at its foot.

piece to this impressive mountainscape is provided by the temple rearing its tower majestically on the crest of the huge monolith dominating the range, with another leviathen rock in front serving as a foil.

Sholinghur is a small township on the northern border of the district and of Madras State ; and lies midway between Tirupati and Kancheepuram. About four square miles in area, the town has a population of about 11, 500 according to the 1961 census. Lying in a rich paddy bowl in mountain girt country, the town once enjoyed a very prosperous dying and weaving industry. To this day, a section of the community is engaged in this industry with varying fortune. The place, however, has enjoyed, from the dawn of South Indian history to modern times, a prominence which does not seem to be borne out by its present humble look and size.

Sholinghur Town

The name " Sholinghur " is the anglicised form of Cholasingapura of Vaishnavite mythology and literature and Cholalingapura of Saivite tradition. It is one of the 108 " Tirupatis " (Holy places) of Vaishnavism. According to tradition, Lord Mahavishnu in his incarnation as Narasimha, gave darshan in *yoga samadhi* on the hill to his devotees, Prahlada, the *sapta rishis,* and the devas for a *ghatika* or 24 minutes. That gave the place its name *Ghatikachala,* and *Tirukkatikai* in Tamil. Another explanation is that the name is derived from " Ghatika, " i.e., university or seat of learning, which flourished at this place in the past.

It is said that the Chola King, Aditya, who overthrew the Pallavas and established Chola hegemony over Tondaimandalam, encountered severe reverses in the neighbourhood of Sholinghur during the wars and when he was losing heart, Lord Siva appeared to him in a dream and encouraged him to fight on. He did so with ultimate success and in gratitude built a temple over the Linga which he found at the place and it came to be known as Cholalingapura. It is interesting to note a similar tradition connected with the temple at Tirumullaivayil, ten miles from Madras City.

Temples of Sholinghur

The temple on the higher hill is dedicated to Lord Yoga Narasimha and his consort, Goddess Amurtapalavalli. The temple is built on a huge boulder on the top of the ridge. To its right is another hill of lower height on which stands the temple of Lord Anjaneya. The deity, in this temple is also in *yoga pose,* and is shown with four arms, the additional ones bearing the Conch (*Sanku*) and the discuss (*Chakra*) of Lord Mahavishnu. According to Mythology, Lord Anjaneya was armed with these weapons by Lord Mahavishnu and sent to help King Indradyumana to put down the Kalakeya rakshasas who were terrorising the country around.

In between two hills is the village of Kondapalayam consisting mostly of choultries for pilgrims seeking solace at these shrines. There is a common belief that worship at the shrines, particularly of Lord Anjaneya of the lower Hill, in the prescribed manner helps to cure physical and mental disorders and " barrenness " in women. Large numbers also resort to this shrine for getting rid of evil spirits " possessing " them and on any day the visitor can see the touching spectacle presented by such afflicted women.

Climbing up the hill, particularly the higher one, was an arduous task some years ago. It is about 1,800 feet high and the gigantic boulders and steep slopes made ascent difficult. An easy flight of steps has been now laid with shelters at convenient points for rest, and ascent is now very much less trying. In and around the hill on which the temples stand, are ponds, precipitous rocks, and narrow gorges which provide thrills for the seeker of adventure. The area abounds with monkeys—and the visitor may have to be alert admist all the amusement he may get.

Lakes and ponds, when they are full, spread their glittering waters in the plains below; but often they go dry when the monsoons fail. Yet there is a perennial tank of fresh water at the point where the road forks out to Kondapalayam and Sholinghur town, just a mile from the town. It is known as "*Bhrama Theertham*" (holy pond) or *Thakkan Kulam* and on its bund stands a temple dedicated to Lord Varadaraja. In the centre of the town stands the temple of Bhakta Uchita or Thakkan and to its north-east stands the

temple of Lord Cholalingeswara. Sri Swami Doddacharya, the scholar saint who lived here in the 16th century and is revered as a descendant of one of the direct disciples of Sri Ramanuja, is credited with having re-built on fresh plans both these temples with munificent help obtained from the Vijianagar ruler. It was to give *darshan* to this devotee in his inability to travel to Kancheepuram for the " Garudotsava ", that Lord Varadaraja manifested himself in " Garuda vahana ", as he was offering morning prayers at the Thakkan Kulam. There are at least 25 other tanks and ponds in the vicinity, some of them located amidst beautiful surroundings deep in the hills which are considered to be of great merit by the devout. To the holiday seeker and lover of nature, these places, so full of quiet and refreshing atmopshere, serve as tonic.

Just a few miles from Sholinghur lies Perunkanchi, once a strong center of Jainism. Relics of Jainism are believed to lie about this place even now.

Historical importance

Sholinghur figured prominently in the wars of the past, especially in the Wars of the East India Company with Hyder Ali of Mysore. In an astounding feat of Military Strategy Hyder Ali tore down from his capital, through Chengamma Pass into the Carnatic, causing consternation to the Company Factors in Fort St. George. The course of the war which followed remained indecisive despite major defeats sustained by both sides, until Hyder's death in 1782.

One of the numerous engagements in the War was fought in September 1781, South of Sholinghur town, below the hills. The English General, Sir Eyre Coote, caused a surprise to Hyder, but Hyder reacted swiftly and in the fighting which ensued was constantly threatening the English ranks, while all the while he kept his eye on " the leading principle of his manouvres, never to risk his artillery ". He, however, had to sacrifice a good part of his magnificent cavalry; but he succeeded not only in harrassing the English but in delaying their march to the relief of beleaguered Vellore. Coote's gain were three cavalry standards and a solitary gun which had got bogged in the field, sodden by overnight rain and his loss about 100 officers and men. But he was in such sore straights for supplies—indeed, he had been so far quite some days—that he wrote from the field of battle that he " would willingly exchange the trophies gained together with the credit for victory for five days' rice ". Hyder Ali's loss in men and horses is variously estimated by the several chroniclers, at 1,000 to 5,000.

A modest low-walled rectangular construction at the southern entrance to the town marks the graveyard of Hyder's men.

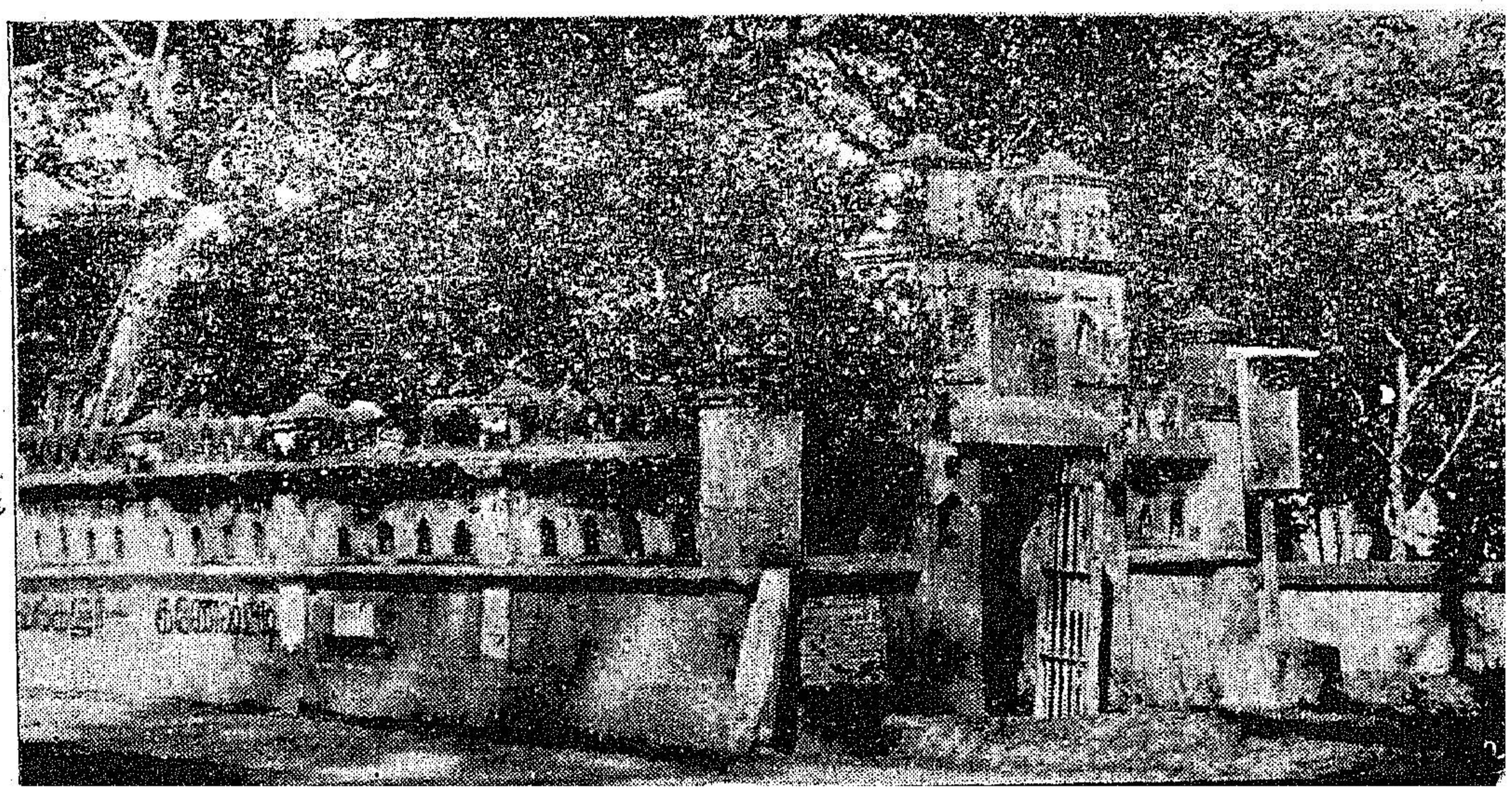
Ranges of hills

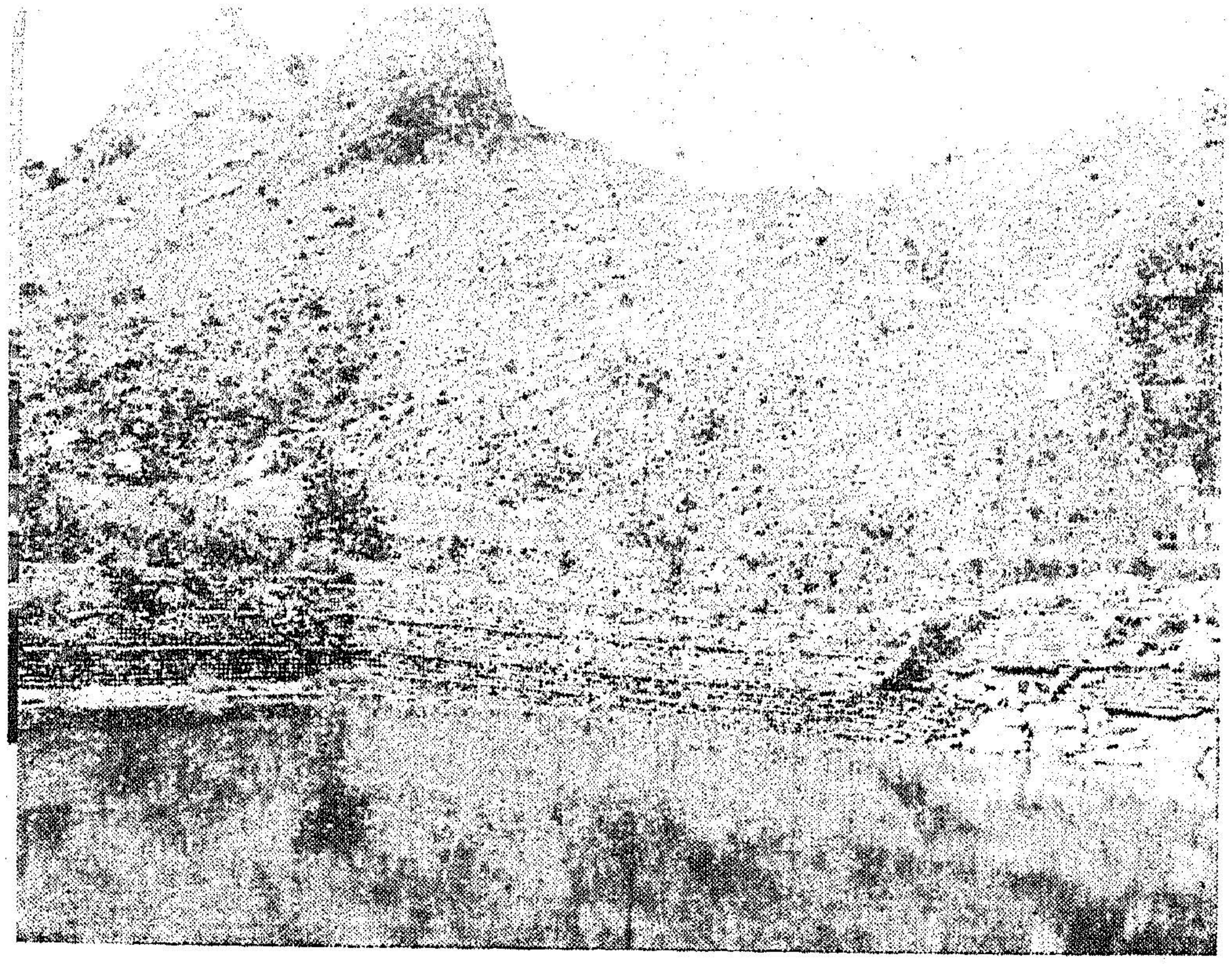
The ranges of hills near Sholinghur and in the neighbouring region are remarkable from the geological point of view also. In the Sholinghur area, the hills rise to precipitous cliffs and peaks. One notices in this area as in the adjacent Perumalrajupet and Tirutani hills, rocky ridges and formations known as " trap dykes ". Bruce Foote, a pioneer of the Geological Survey of India, more than a century ago, conducted a survey of the entire region and his account is a monumental contribution to the study of geology of this area, as indeed are his accounts of all the areas he surveyed. Trap dykes, in lay language, are " wall like masses of rock projecting beyond the surrounding surface and filling up vertical or inclined fissures in the strata ".

The formations in the region of Sholinghur are considered to present features which make them " one of the most remarkable displays of trappean injection known in any country ". Some protrusions like those in the neighbourhood of Puttur and Nagari, about 20 miles northeast as the crow flies, display pleasing colours also. Even more striking is the magnetic character attributed to the dykes in the Sholinghur area which is said to be so strong as to affect the needle of the compass markedly. Trap dykes, ordinarily, are not more than a few yards wide; but the dykes, in these parts are " not only extremely numerous but are of large size " having a width of some 50 to 100 paces.

Sholinghur is within easy reach of Madras City, just about 70 miles by road. A good bus service connects it with Arkonam Railway Junction, about 17 miles east and with Tiruttani, a little less, to the north-east. The place, surrounded by rocky hills, has generally a dry air even during the rainy months and is quite hot during summer.

A modest low walled rectangular construction at the Southern entrance to Sholinghur Town marks the grave yard of Hyder Ali's men fallen in the battle fought there in 1781.





The Sholinghur Hill Temple with the *Theertham* sacred pool at its foot.

There is a well equipped Rest House beside the fork of the road near *Thakkan Kualm,* and quite a good number of private rest houses and choultries in Kondapalayam and in the town.

Other attractions

The visitor from town will find much in the place which is not only agreeable but exhilarating. The mountainscape, a climb uphill at any chosen spot, the general air of restfulness and the natural beauty of the countryside are bound to make an abiding impression. The devout will find additional attractions in the hill shrines and the Temples in the town below. The lover of history will find much to interest him in the environs of the towns so full of interesting places like "Kumpinipet", "Pulivalam", "Banavaram", etc. Being so close to Kancheepuram, the seat of the Pallavas and the heart of Tondaimandalam the place and its neighbourhood, particularly south and southeast of Sholinghur have much to interest the students of archaeology. On occassions cheetahs and other common wild life are found in the hills and more frequently in the hills further north.

It is a good idea that the Madras Government propose to develop this place as a popular resort. Water-supply during summer months may present a problem but possibly subsoil sources may be tapped with advantage even in the more elevated spots. One, however, hopes that plans for development of the place will be so designed as to maintain intact all that now makes a visit to the ancient place so worthwhile, while providing more amenities and larger avenues for its enjoyment.

MOVEMENT OF COARSE GRAINS

The Government of Madras have authorised the officers specified below to issue permits for the export of coarse grains from any place within their respective jurisdiction to any place outside the State of Madras up to the quantities specified therein.

Taluk Tahsildars may issue permits up to 100 bags of 75 kgs. each of any of the millets subject to the export quota fixed; Deputy Collectors in charge of Divisions up to 250 bags of 75 kgs. each of any of the millets subject to the export quota fixed; Collectors up to 500 tonnes of each of any of the millets subject to the export quota fixed; Commissioner of Civil Supplies, Director of Civil Supplies and Secretary to Commissioner of Civil Supplies without limit subject to the quota to be moved out of the State.

The Government of Madras have authorised the Collectors of all districts, District Revenue Officers, Joint Collector, Coimbatore District, District Supply Officers, Deputy Collectors and the Taluk Tahsildars to issue permits for the transport of coarse grains to or within the border area, within their respective jurisdiction and without any quantitative restriction.

YOUR PROGRESS DEPENDS ON YOUR *Savings*

S. SRINIVASAN,
Assistant Regional Director,
National Savings, Madurai.

The Panchayat Raj is now with us. Gram Panchayats and Panchayat Unions have assumed full responsibility for promoting social, economical and cultural activities besides intensive agricultural development in their jurisdictions. It is for these bodies to promote planned development by mobilising both physical and financial resources for the well-being of the community they represent. Promotion of thrift and development of the savings habit must, therefore, form part of their major responsibilities.

With the advent of freedom, there is a mass awakening among the people to a new consciousness of their needs and rights. They are rightly demanding more amenities and better living conditions. Our Five-Year Plans have been conceived and are being implemented to achieve these and many other objectives. Every one of us is a beneficiary of the plans and every one has a stake in it. It is, therefore, imperative that we must practise thrift and invest our savings in the country's development. This can be done only with an abiding faith in our future and by dedicating ourselves to this task with a zeal. The Five-Year Plans are thus tied up with our aspirations and hopes for the future and their successful implementation is the responsibility of every citizen.

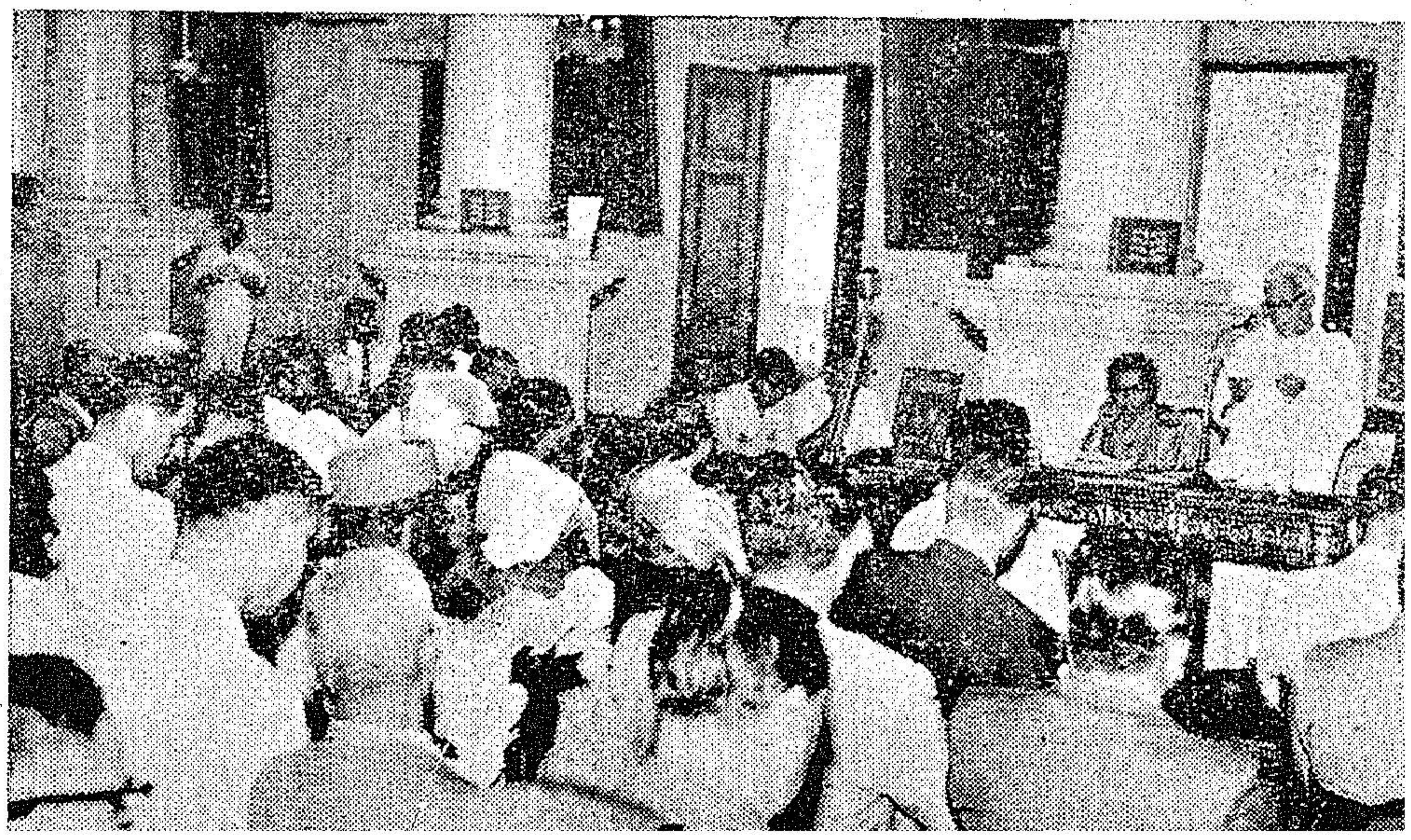
Savings Committees.

A small savings movement is essential in an under-developed country, because it builds up an atmosphere of thrift and enables more and more people to participate in the nation-building projects. The question is now to create this atmosphere. Generally an official agency, however efficient, cannot succeed in this, for obvious reasons. People with experience of public life have, therefore, to be persuaded to come forward and apply their experience for the success of the movement. In other words, it is necessary to combine the officially trained mind with the non-official approach.

We, in Madras State, have made some leeway in this direction by mobilising the support of the representatives of the people (viz., Gram Panchayats and Panchayat Unions) for the intensification of the Scheme in rural areas. Savings Committees at Gram Panchayat level are being organised with the President of Panchayat as the Chairman and the village level worker of the group as the ex-officio secretary. Not less than three to four members representing various interests like members of the Village co-operative, members of the Village Volunteer force, members of Madar Sangham, School teachers and Branch Postmasters are nominated to these committees. The Committee meets once a month and discusses ways and means to educate the people in the benefits flowing from the scheme. The Extension Officer in each Panchayat Union has been entrusted with the work of ensuring that the Gram Panchayat savings committees meet at least once a month.

At the Panchayat Union level, a powerful non-official committee has been organised with the Chairman of the Panchayat Union Council as President, and the Commissioner of the Panchayat Union as the ex-officio secretary. Not less than six members are selected from

Chief Minister addressing the representatives of the Chambers of Commerce and Trade Union Leaders on the "Promotion of Small Savings".



Srimathi Gnanasundaram Bhaktavatsalam distributing uniforms to children at the School Improvement Conference held recently at St. Gabriel s High School, Madras.

different interests, viz., teachers, advocates, social workers, people connected with Sarvodaya movement, Bharat Sewak Samaj, and selected Panchayat Presidents from that Union.

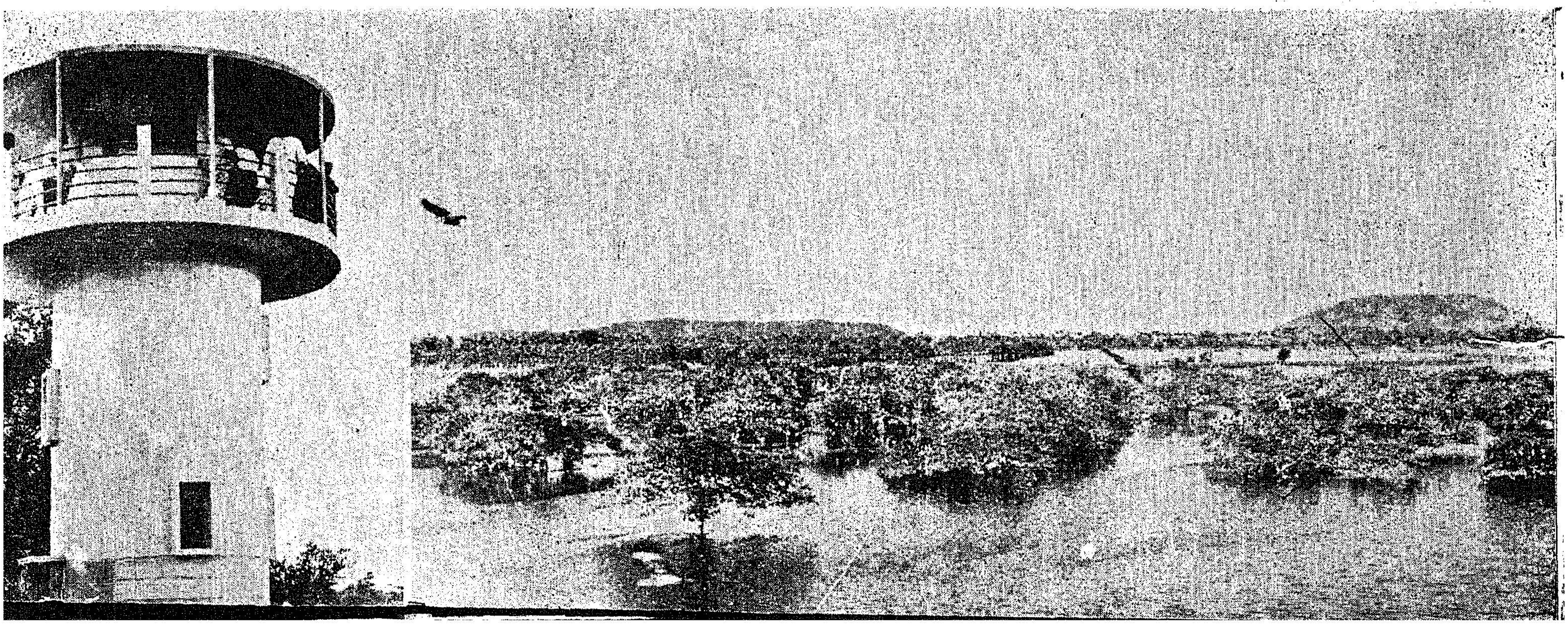
Role of the Committees.

All these committees are non-statutory bodies with powers to co-opt any number of members if, in the opinion of the committee, such addition will be in the interest of the savings movement. These Panchayat Union level committees meet once a month along with the monthly Council meeting of the Union to review the work of each Panchayat Level Committee under that Union. Each Gram Panchayat has been given a financial target on the basis of population and potentiality. The Government of Madras have fixed a target of Rs. 2 per head per year for collection towards small savings in each Panchayat Union. In addition, the Government have suggested that the subject "Small Savings" should invariably be included in the agenda and discussed at Panchayat Union Councils and District Development Council meetings. Thus, the savings movement is generated from the village level through the Panchayat administration.

Once in two months, the District Development Council—a statutory body with the District Collector as the Chairman and all the Chairmen of the Panchayat Unions in the districts, M.L.As., M.Ps., Municipal Chairmen and District Officers, connected with the developmental schemes, as members—review the progress of all activities including small savings. At the District Development Council every Panchayat Union Chairman is asked to report on the progress in his Union in intensifying the savings movement and to offer suggestions, if any, to improve publicity and progress of collection for small savings securities on the basis of the target fixed. In addition, we are appointing non-official agents at the rate of five agents for each Panchayat Union. These agents, with the active support and assistance of the Gram Panchayat committees, are asked to canvass for subscription in small savings from every household in their areas concerned.

Thus, the non-official machinery from village level onwards has been geared up to mobilise the savings of the community with the help of the authorised agents.

Observation tower at Vedanthangal Bird Sanctuary was recently inaugurated by the Co-operation Minister Sri N. S. S. Manradiar.



MADURAI THIRUVAPPADAIR KOIL CO-OPERATIVE SOCIETY

The Madurai Tiruvappadayarkoil Hand Pounding Co-operative Society, Limited IND. 131, Sellur, was registered under the Madras Co-operative Societies Act VI of 1932 on 28th June 1957 and started on its work on 23rd August 1957. The society was organised exclusively for the uplift of the denotified tribes who are the members of the society. At the time of starting there were 37 members mostly women and as they could not subscribe more than Rs. 37 in total as their share capital, the Government helped them by disbursing Rs. 50 each as share capital loan. In addition, a working capital loan of Rs. 10,000 and Reserve Fund Subsidy of Rs. 2,000 were also sanctioned to the society to commence business activities. The society commenced production on 21st November 1957, providing employment to eight of its worker members. The number of worker members gradually increased and now there are fifty families of ex-criminal tribes who are getting employment in the Society.

The society is supplying hand-pounded rice to the public, Government Institutions like Government Hospitals, Jails and Hostels. The statistics furnished below show the progress and achievement of the society over the years.

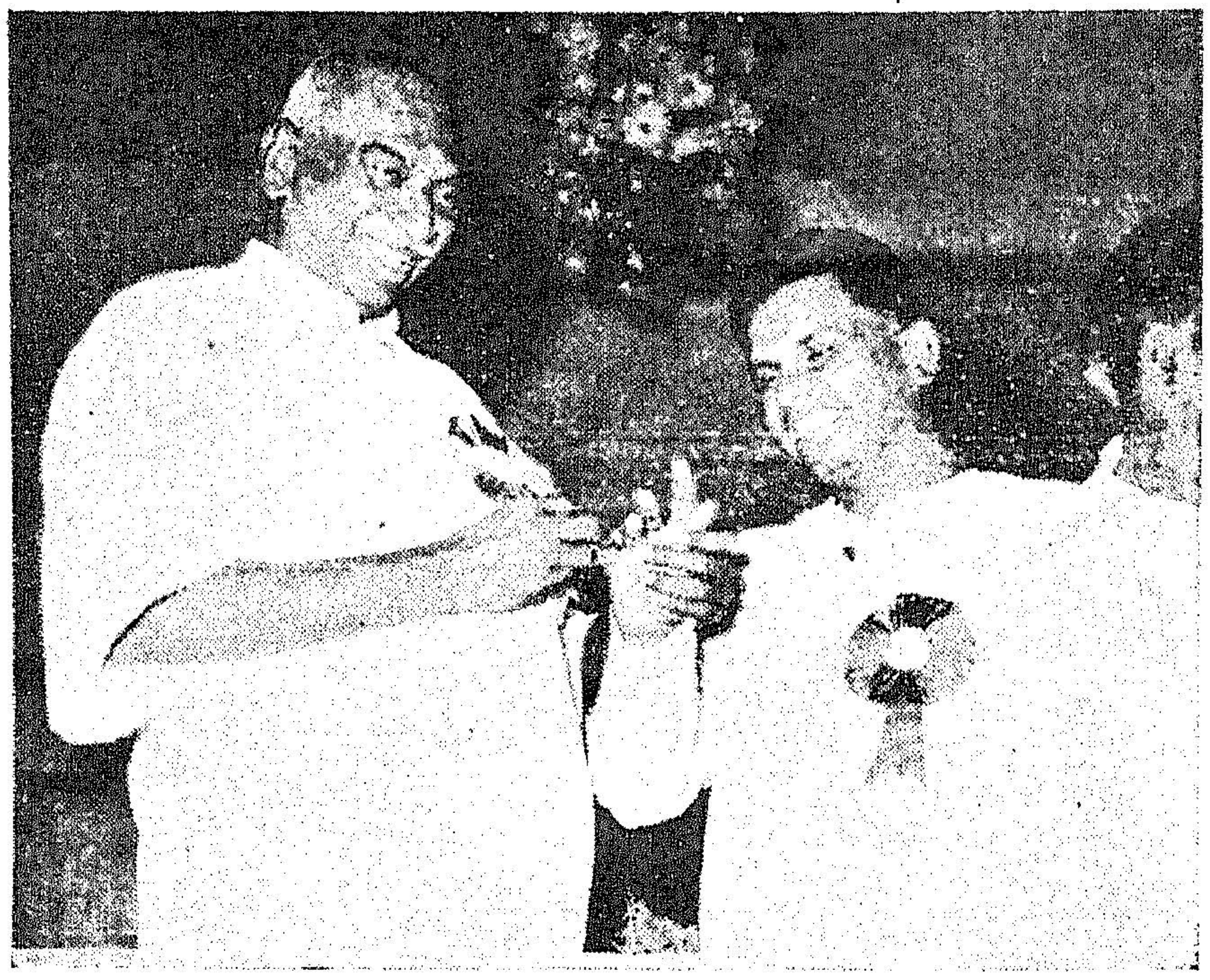
Year.	Number of members.	Number of members provided employment.	Production. (IN RUPEES)	Sales. (IN RUPEES)	Wages Paid. (IN RUPEES)	Profit (+) or Loss (—). (IN RUPEES)
1957–58	37	8	6,748	7,600	615	675 (+)
1958–59	43	18	31,350	37,100	2,900	2,500 (+)
1959–60	35	22	35.120	43,700	4,300	2,876 (+)
1960–61	46	28	28,200	36,800	2,900	1,053 (—)
1961–62	62	31	46,470	57,200	6,000	94 (+)
1962–63	69	30	48,315	60,000	6,200	1,588 (+)
1963–64	75	40	46,000	52,300	5,400	1,600 (+)

The society is also dehusking paddy received from private persons and receiving wages for it. Many paddy owners utilise this society for dehusking paddy for their house consumption. This is the only society in the State which is selling "Ag Mark" hand-pounded rice.

During 1960–61, the society started a Model Production Centre with financial assistance of Rs. 4,000 as grant and Rs. 5,000 as loan received from the Government under this scheme, 45 worker members were given training in modern method of boiling, drying and producing hand-pounded rice by emery chakki. The special features of this scheme are popularised in the exhibitions held in and around Madurai City.

A Gramodyog Sales Depot (A) Type was functioning in the society for the publicity of village industries products and the depot is now being run departmentally with separate establishment.

As more and more members from ex-Criminal tribes joined the society to avail themselves of the opportunities given by the Government, a special



Sri K. Kamaraj, All-India Congress President inaugurated the Silver Jubilee celebrations of the Ammapet Handloom Weavers' Co-operative Production and Sales Society on 4th May 1965 at Ammapet, Salem district.

Sri K. Kamaraj is seen presenting a diamond ring to Sri Mariappan, President of the Society, in appreciation of his service to the Society.

training scheme was started during 1963-64. About 45 new members in three batches were given training about the various simplified methods of production of hand-pounded rice. A grant of Rs. 843·75 was received from the Khadi and Village Industries Board and this amount has been utilised as stipend to the trainee-*cum*-worker member during the period of training.

The society had purchased a site to the extent of 95 cents in Nagamalai Pudukottai (6 miles from Madurai, on the Madurai-Usilampatty Road) for Rs. 3,356. Sri U. N. Dhebar, Chairman, Khadi and Village Industries Commission was pleased to lay the foundation stone for the buildings of the society on this site on 26th March 1964. The society is taking steps to construct godown, office, drying yard, etc., on the site. Necessary financial assistance has been provided by the State Khadi and Village Industries Board for the above purposes.

In the present days of rising prices, the members of the society have fully realised that it is only the co-operative societies which can help the poor people and much benefit can be achieved by co-operative effort in uplifting their economic condition. They are adopting the Gandhian way of life. They are all united and fully co-operative. The management of the society is vested in a Board of seven Directors. Four of the Directors are women. The Board of Directors are elected by the members. The society is one of the best working societies in the Madurai district.

IMPROVEMENT OF STARCH INDUSTRY

The Government of India (Department of Industry) have constituted a committee to assess the present production of starch and recommend to Government the use of indegenous raw materials other than maize for the starch industry. The Committee has been asked to assess the production possibility of raw materials and the requirement of starch for the various purposes such as, textile, glucose, export, paper industry, etc. The Committee has also been asked to suggest measures needed to put the tapioca industy on sound basis including the bye-product utilization.

The Committee has ten members. The Director of Industries and Commerce, Madras, is the Chairman of the Committee.

-HIGH PRESSURE BOILER PLANT AT TIRUCHI-

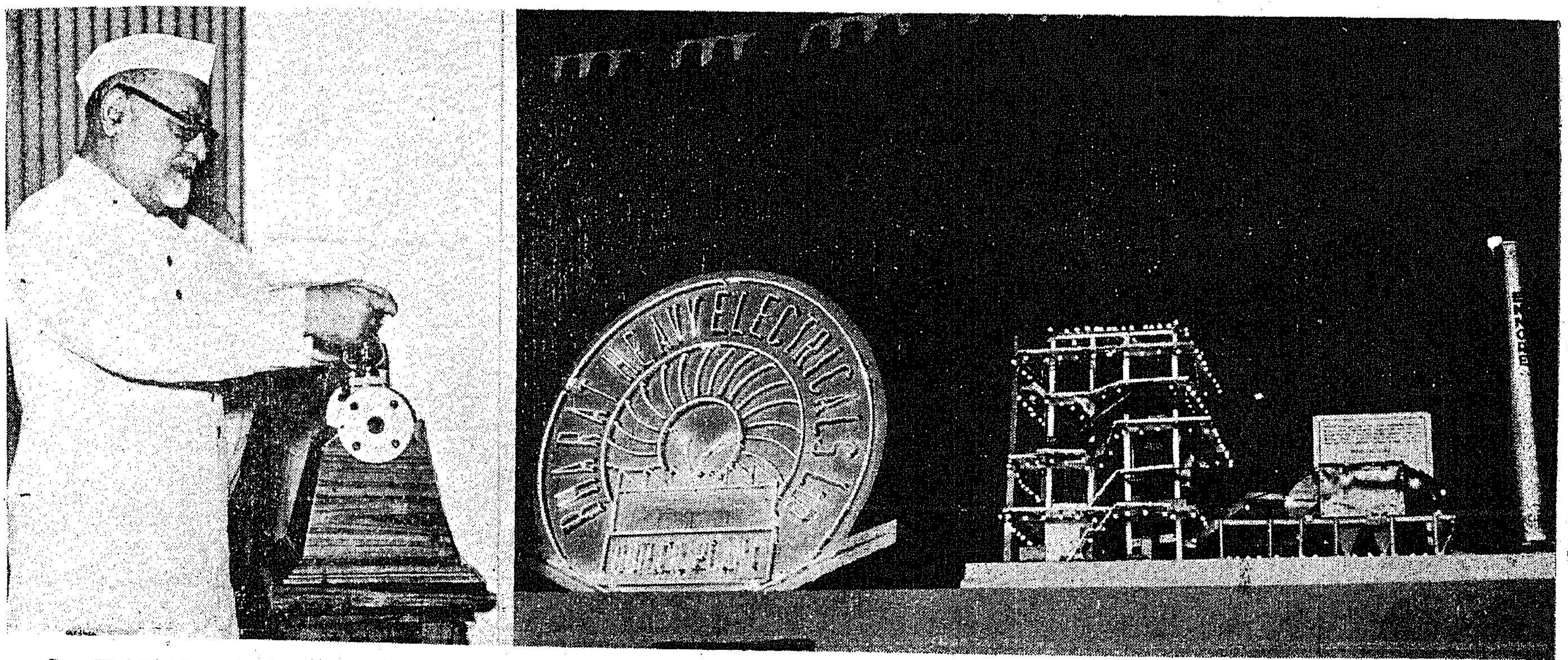
Despite a delay of some six months in commencing the construction work, the Tiruchi High Pressure Boiler Plant is being completed in all respects three months ahead of schedule. The plant is one of the biggest production units in India.

The Government of India approved the location of the High Pressure Boiler Plant as a Unit of Bharat Heavy Electricals, Limited, for the manufacture of High Pressure Boilers at Tiruverambur, Tiruchirappalli, after the site was jointly inspected by a team of Indian and Czechoslovakian experts in March 1961. The main considerations which influenced the selection of this site were availability of extensive vacant level ground (3,000 to 4,000 acres) belonging to Government, good soil, low sub-soil water level, abundant water-supply, good road and rail communications, and availability of power.

This Boiler Plant Unit started its activities at Tiruchirappalli on September 16, 1961, with the appointment of a Project Engineer.

Pending preparation of the Detailed Project Report and the sanction of the Government, work connected with acquisition of the required land, survey and investigation of water-supply, railway sidings and road facilities was done.

An agreement had been entered with Technoexport (an organization of the Government of Czechoslovakia) regarding the preparation of the Detailed Project Report in June 1961. In the preparation of this report, a team of Indian Engineers was associated with the experts of the Czechoslovak Design Organization. This association helped the Indian Engineers in the planning and execution of the actual construction work.



Dr. Zakir Hussain, Vice-President of India, is inaugurating the High Pressure Boiler plant at Tiruverambur near Tiruchirappalli.

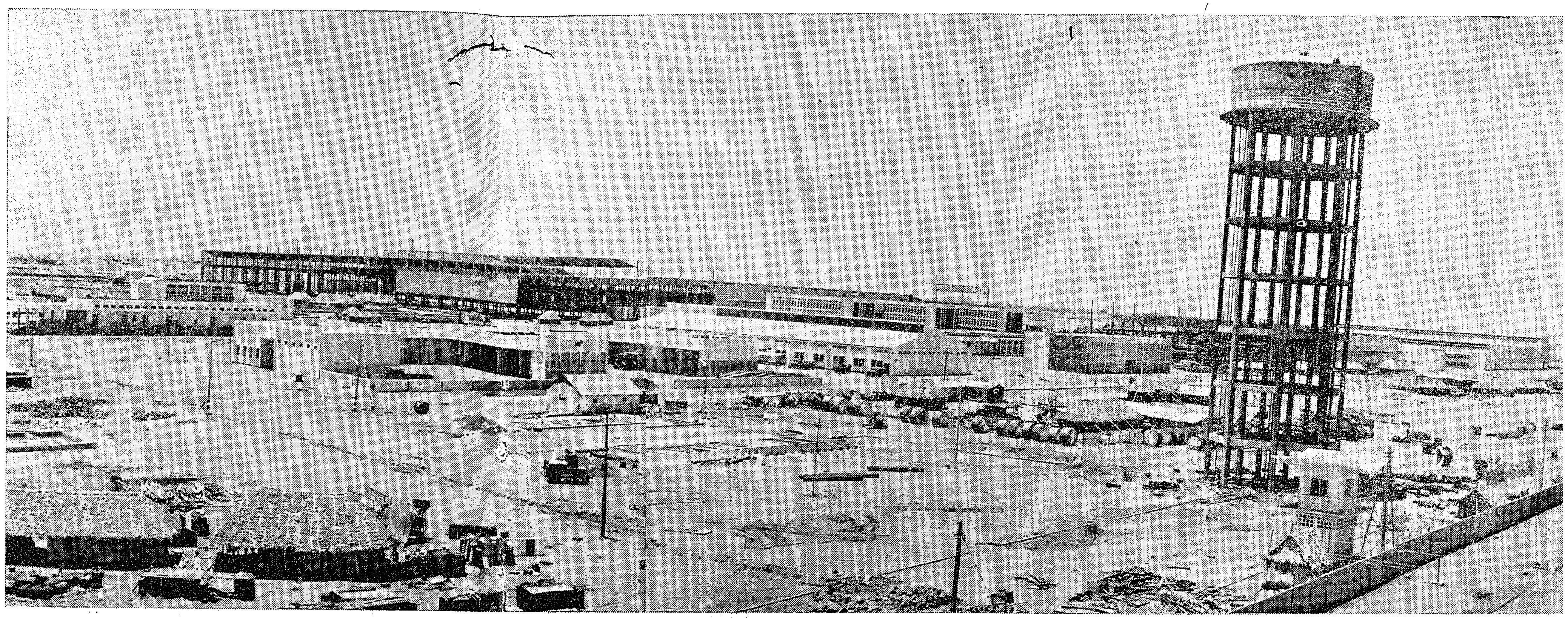
Thus between May and August 1962 preliminary work of levelling of factory area, water-supply arrangements and structural design for the factory was facilitated. Also, preliminary arrangements for the procurements of structural steel, preparation of inventory lists, track materials for railway siding, etc., could be made. The Project Report plans were used for purposes of calling of tenders thereby saving a lot of time. Actual work was started in the factory area at the end of May 1963, when the Government approved the Project Report.

Main Factory Blocks

The main three production shops in the factory are : (1) Boiler Production Shop; (2) Mechanical and Maintenance Shop; and (3) Boiler Fittings Production Shop.

The floor area of the three Factory Blocks put together works out to 107,400 square metres. Besides these, there are ancillary buildings like Design and Administrative office blocks of each of the three factory blocks, Carpentary Shop, Fire Station, Boiler Fittings Test Station, Oxygen House, Acetylene House, Producer-Gas Station, Compressor Station, Inflammable Store, Central Mechanical, Chemical and Metallurgical Laboratory, Administrative office, Canteens and Security office.

One of the special features of the layout is the provision of a sub-way under railway sidings connecting office block and shop building of the Boiler Production Shop. All the workers and other staff will use this sub-way for going to the Boiler Production Shop.



An aerial view of the High Preasure Boiler Plant, Thiruverambur near Tiruchy.

THINGS TO BE PRODUCED

The Tiruchy High Pressure Boiler Plant, to begin with, is designed to produce 700-850 MW of high pressure boilers and 10 to 12 package boiler units for production of process steam used in Rice Mills and other industries and has a surplus capacity of about 2,600 tonnes of high pressure values, drums, receptiles, etc., required for various industries including Chemical Plants. The Plant will manufacture high pressure boilers with a total capacity of 750 MW per year, boiler fittings up to 1,800 tonnes annually and 10 package boiler units. Its contribution towards power generation during the Fourth Plan period is likely to be 8 boiler units of 60 MW and 7 boiler units of 100 MW. The first two units of 60 MW of the Plant have been assigned for the Ennore Thermal Power House near Madras.

Each of the three factory blocks have their own power sub-stations, the Boiler Production Shop alone having five sub-stations for iteself, in addition to the main entrance sub-station to the factory.

The Boiler Production Shop has a floor area of 81,900 square metres and 8,600 tonnes of fabricated structural steel. There will be 47 overhead cranes, the heaviest being of 120 tonnes capacity. Heavy duty concrete flooring with an average thickness of about 25 centimetres had to be provided to meet the production requirements.

Special Features

A special feature in the construction of the factory blocks was the taking up the flooring work before the erection of the structural steel. The work of factory flooring to the tune of 107,400 square metres with an average thickness of 25 centimetres is itself a big job, which would have taken a lot of time to complete. To save time, the work of factory flooring was taken up as soon as column foundations were completed and without waiting for the erection of the structural work. The machine foundation work was also done side by side where foundation drawings were available so that as soon as each bay is roofed, it was possible to take up the work of erection of machines. For other machines, pockets were left in the flooring. By this unorthodox procedure valuable time almost a year in the factory construction period was saved.

An important aspect of the steel fabrication work was that a major portion of the structural steel required was fabricated at site by different contractors. Out of the 11,000 tonnes of steel, nearly 7,000 tonnes of steel was fabricated at site. As a result, there has been saving in freight charges of fabricated materials and in transit time, avoidance of damages to the fabricated structures in transit, better co-ordination between fabrication and erection and better progress in erection work.

From the experience gained in "site fabrication", it could be safely said that in spite of lack of proper shop facilities, adoption of site fabrication has many advantages.

Training Centre

Since the considerable number of skilled workmen in the different trades needed for the factory cannot be found from the open market within a short period, approval was given by the Government for setting up of a Training Centre. The Training Centre consisting of a building for theoretical instructions, a Workshop and two hostels to accommodate 400 trainees was inaugurated in July 1963. Recruitment of trainees has been staggered to take place every three months, so that availability of skilled men on the Shop floor will be progressive in step with the demands of production.

In order to build up the requirement quickly, the Training Centre will be worked in two shifts so that 800 persons at a time can be trained. Of these, 400 will stay in the hostels and the other 400 will be in Staff quarters at two per room.

SALIENT FEATURES

- * Work commenced on 16th September 1961.
- * Total outlay of the Project is will be about Rs. 23·5 crores.
- * Foreign Exchange component in the capital cost of the Project will be about Rs. 9 crores.
- * In terms of money the annual production capacity is estimated at Rs. 22 crores.
- * At full production the plant will help to save foreign exchange to the tune of Rs. 10.15 crores annually.
- * Despite six months delay in the commencement of work it will be completed in all respects three months a h e a d of schedules nine months quicker than the estimated period.

Psychometric tests have been introduced as a regular feature in requirement for all categories so that wastage during training will be kept to the minimum. When the main bulk of our recruitment has been met, the recruitment of artisan trainees will be tapered down to cater to our normal wastage requirements and other training course introduced, e.g., promotion courses, refresher courses, subordinate supervisory training, etc.

Graduate Engineer training to provide the necessary officer cadre has already been started and will be expanded as required.

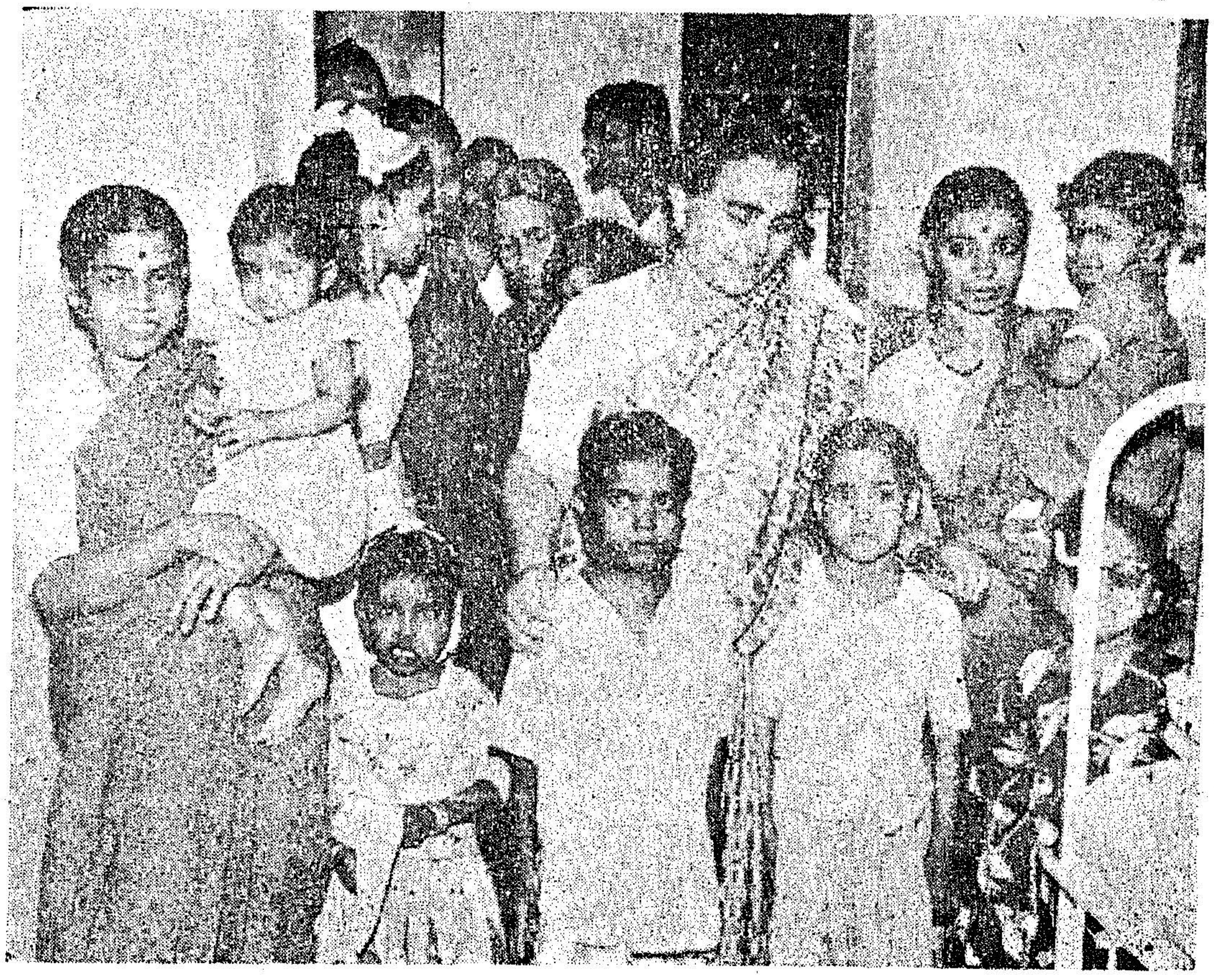
To meet the immediate requirement of technical officers for production as well as Design, Graduate Engineers with varied degrees of experience were selected and sent to Czechoslovakia for specialised training for periods varying between six months and 2½ years. Those meant for production jobs are taking up positions. Those sent for Design work are nearing completion of their training but will stay on in Czechoslovakia for a few more months in order to be associated in the preparation of Design and Production documentation for the first boilers and fittings.

In order to train our workmen on the specialised and sophisticated machines and in the different special processes, Craft Instructors from the Training Centre were hand-picked and sent to Czechoslovakia for training. On their return, they are training skilled workmen on the Shop floor. These Instructors will then take up positions of Foremen and Assistant Foremen in the factory.

A small indigenous development cell has been set up and is collecting information on indigenous availability of boughtout components like gear boxes, couplings, steel and iron castings, forgings, etc., consumable raw materials like electrodes and fluxes welding wires and lubricants. After making sure that the indigenous supply will satisfy our requirements, the cell passes on the information to the Stores and Purchase department, so that the indigenous element in the purchases will be maximised.

Costs

The Government, when accepting the Project Report in May 1963, approved of an outlay of Rs. 181·4 millions



Dr. Susila Nyyar, Union Minister for Health at the 10th Anniversary Celebrations of the Cancer Institute, Adyar.

for the factory. The foreign exchange content was to be 51·2 millions. The breakup of the outlay was as follows :—

		RS. IN MILLIONS.
Civil Services Buildings	..	70·7
Power and Gas Services	..	17·7
Machinery and Equipment	..	93·0
Total	..	181·4

In addition, the training centre with its hostels were to cost Rs. 9 millions and the township of 3,000 houses Rs. 42 millions.

Of the above, the cumulative expenditure up to March end this year is about Rs. 151 millions representing ⅔ of the estimates. There are some costly machines yet to be received (not required immediately for production) like roll plate, bending machines, large-size lathes and furnaces for the manufacture of Boiler drums. A number of quarters are yet to be completed in the township, and these will account for a major portion of the balance of the estimate.

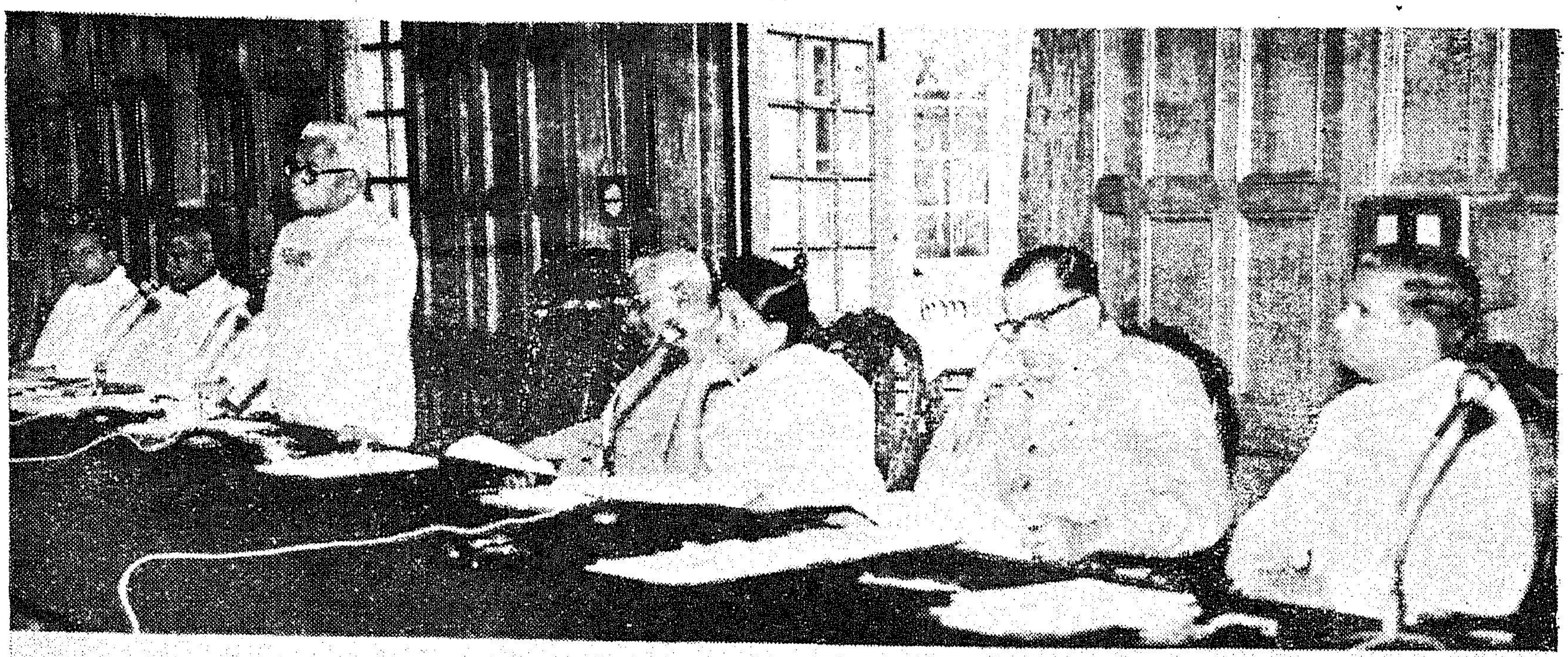
The foreign exchange expenditure is likely to be Rs. 53 millions as against Rs. 51·2 millions provided for. The excess is mainly due to having to provide for release of foreign exchange to indigenous supplies of overhead cranes and other items, who had to import a few components from abroad. On the other hand, in spite of increase in Customs duty from 10 per cent to 26½ per cent on imported items, the overall expenditure is not expected to exceed the original estimate of Rs. 232·4 millions by more than Rs. 1·4 millions. This has been possible only due to a continued watch and immediate alterations being carried out in Designs and original proposals, as construction progressed.

FIRST OF ITS KIND

Dr. Zakir Hussain, Vice-President of India inaugurated the High Pressure Boiler Plant near Tiruchirappalli on 1st May. In his inaugural address he said that I need hardly mention to you what a serious obstacle our dependence on imports for electrical equipment has been, a large proportion of the machinery and equipment required to be imported year after year involving substantial outgo of foreign exchange. With an ever increasing demand for power in this country we cannot obviously afford to rely on imports for all time. Indeed, we need to conserve foreign exchange for other pressing requirements. It is against this background that we have decided to embark upon Heavy Electrical industries for manufacturing boilers, steam and hydraulic turbines and other heavy electrical equipment. In addition to what are already being manufactured in this country, a beginning has been made in Bhopal in the public sector. Bharat Heavy Electricals have on hand three projects. All these are going to make significant contributions to achieve a substantial degree of self-sufficiency in the matter of heavy electrical equipment requirements of the country.

The High Pressure Boiler Project at Tiruchirappalli is the first of its kind in the public sector. This will supplement the indigenous production from the A.V.B. factory at Durgapur which was set up in 1962. These high pressure boilers are an essential part of thermal power generating equipment and in terms of value account for about half the equipment requirement for a power house. I am glad that an important step in the right direction has been taken to augment the supply of boilers as a part of the overall programme for self-sufficiency. I am also glad to learn that the site at Tiruchirappalli has been developed to take care of further expansion of the plant.

COLLECTORS' CONFERENCE AT OOTY



Chief Minister Sri M. Bhaktavatsalam (*top*) addressing the Collectors' Conference held last month at Ooty.

A FEAT IN ENGINEERING SKILL

Sri K. B. MATHUR,
Chairman, Bharat Heavy Electricals, Ltd.

In this article, the Chairman of the Bharat Heavy Electricals, Sri K. B. Mathur, deals with the complexities of production planning of the High Pressure Boiler Plant at Tiruchirappalli which was inaugurated by the Vice-President of India on May 1.

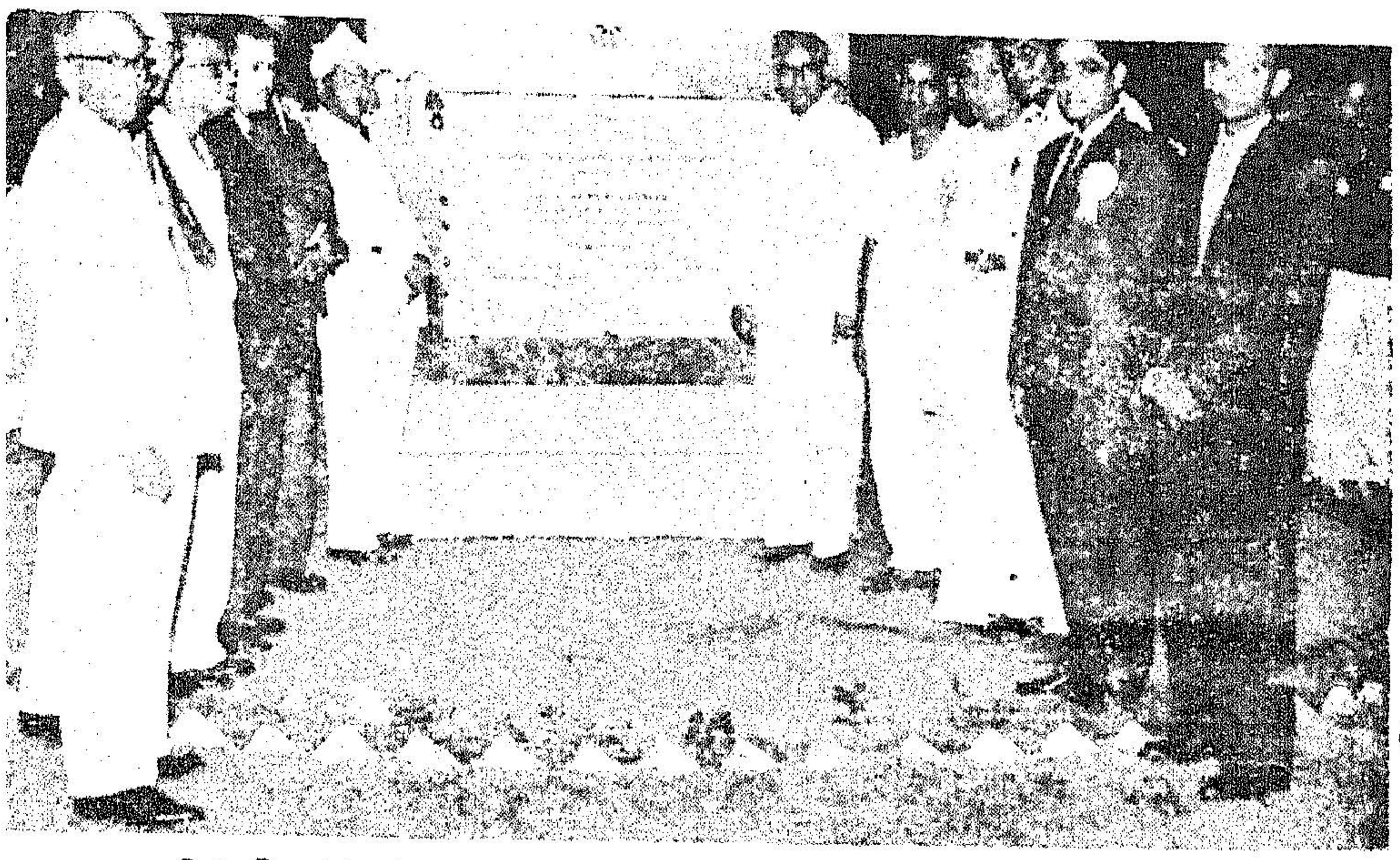
A remarkable advance in the productive potential of heavy electrical equipment will be witnessed during the current year—the closing period of the Third Plan. One by one the offsprings of Bharat Heavy Electricals will go into the production stage, geared to make their contribution to the industrial growth of the country. The first in this chain is the High Pressure Boiler Plant at Tiruchirappalli.

What planning for production has preceded and what will be succeeded is indeed an absorbing topic of considerable interest. From the inception, the central objective is production, as it constitutes the basis for the design and equipment of an industrial unit. It engages attention continuously, while the construction work is in progress. The pattern of demand is assessed and the training programme of engineers and technicians is modelled accordingly. Technical acumen being deficient, proper training has considerable significance. For higher training, a number of engineers and technicians were deputed to the Consultants Workshops in Czechoslovakia, supplemented by the institution of a Technical Training Centre at the plant site for building up a force of technicians qualified for the impending task.

Design Work

A tentative programme for manufacture was prepared well in advance, so that the design work could proceed. In the case of high pressure boilers, water and fuel analysis of samples which will be used, the site atmospheric conditions, the pressure, temperature and quantity of steam required are the basic desiderata for design work. A general indication of these was furnished by the Central Water and Power Commission, but specific details for the first two units of 60 M.Ws. which will be installed at the Ennore Power House in Madras, became available only recently. Promptly, fuel tests were arranged in boilers installed at Bhilai and the results together with the other data have been communicated to the Consultants. The detailed design of the combustion chamber and ancillary components will now be adapted to suit the specifications and the working drawings of each component, which constitute the basis for production, will only be available progressively in stages. Meanwhile, the design documentation for valves and fittings of a general purpose character as also those for jigs, tools and fixtures, required for processing the various components, assemblies and sub-assemblies, has been secured.

In the initial stages, difficult manufacturing techniques cannot be acquired. Therefore, a number of components have to be imported. As fresh knowledge is acquired, the element of import goes down. The Consultants require timely information of such supply for incorporation in their own Production Plan. Requirements for the Fourth Plan have been finalised and ordered.



Sri R. Venkataraman recently inaugurated Regional Engineering College at Thiruvarambur near Tiruchirappalli.

Production Planning

Production Planning in a large manufacturing unit is a fine art. Balanced production, economy, efficiency and speed are the key notes. Manufacturing processes have to be simplified, integrated and harmonised with the machine loadings with a view to attaining optimum results.

Time Cycles

Production planning, therefore, is based on a realistic assessment of the time cycle of each operation for each item of manufacture. Some of the components pass through a number of operations and on different machines. Multiple operation machines in this context have some significane. Simultaneous operations, on these, however, require a degree of foresight and pre-planning. Further, repetitive manufacture which saves tooling delays is to be aimed at.

The Consultants have their own norms of time cycles built up through years of experience. These will be adapted to our changing experience in line with the varying labour productivity. Production techniques and technology also keep changing with modern equipment and scientific developments and the norms, therefore, are adjusted accordingly. It is an essential function of production planners to continuously look for cheaper and quicker processes as also devise ways and means for maximising the use of indigenous materials in conjuction with their technical and scientific wings. They should also discover imbalances and cushions and endeavour to adjust the former and find suitable output for the latter. When problems of development, replacement or addition of equipment arise, they should be capable of advising the management as to the best solution.

Production Planners, should therefore, acquint themselves with the various manufacturing processes involved in the output of each component and their time cycles. Equipped with this knowledge they should attempt production and process planning in the form of graphs or charts built into an integrated pattern so as to secure optimum results. This is not a simple task particularly in a new undertaking where the productivity levels vary from worker to worker. The longest time cycle for a completed component or assembly is the basic determinant, with which all other manufacture should be synchronised. The sequence in which each component will be needed, its exact time interval in the complete production cycle of the unit, so that it may be ready at the appropriate time, is a matter of vital importance for continuous undisturbed production cycle. Some of the components, particularly those of a repetitive character, are stocked in advance in numbers consistent with the long term manufacturing schedule.

Once these charts have been prepared, they are translated into day to day loading charts of each machine employed for composite manufacture. Time allowance for tooling, maintenance, outages, etc., must be adequately provided for in this planning. Excessive loading or imbalanced loading of machines is then suitably adjusted and a realistic programme thus evolved.

The production Plan also provides a clue as to the requirement of materials, market purchases of components, etc. The production purchase section should normally determine their course of action on the basis of this data. In the initial stage, however, we have to rely upon the details of material requirements and their specifications furnished by the Consultants. It is, however, necessary that a machinery should be set from the inception for material procurement on the basis of a close scientific analysis of the detailed production planning with a view to keeping down inventories. Besides, the normal delivery period, adequate time allowance for securing Development Wing clearance foreign exchange and import permit, however, should be kept in view. In respect of indigenous materials and components, unless the party concerned is well established, careful enquiries should be made in regard to the credentials of new comers.

Technical Wing

Then again, the Technical Wing should keep track of every manufacturing cycle in the factory and its supporting material and components, so that any setback or its likelihood may be provided for in forward planning, lest the entire machinery may get clogged and the Production Plan thrown out of gear. A degree of vigilance is needed on this matter.

It should be appreciated that thousands of working drawing and an equivalent processing features are involved in the manufacture of a composite like a high pressure boiler, turbine or generator. Each component has its own time cycle, its own sequence for use in assembly and what complicates the position for us is the variation in time cycle for the same operation from worker to worker. Productivity techniques should, therefore be freely used, so as to attain a measure of stability at the earlies.

In this environment, a most wide awake, experienced and dynamic team of planners is needed. Initially, it should be supplemented by seasoned men drawn from the Consultants. Much can, however be achieved by an intelligent application of knowledge already acquired and I wish that this nerve centre of production may be assigned to men of vision, courage and determination.

Team Spirit

While all this is of considerable value, the welding of workers into a composite team and securing their goodwill and co - operation is vital. How this is to be done is again a managerial skill. There are well-defined centres of activity, each one being a composite team. Select the most influential in each team to captain it. Take him in confidence and let him be the spear-head for action in his team. Engender a spirit of competition backed by suitable incentives. What motivates a man in a complex society is indeed an enigma, but one thing is certain that genuineness, fairness, open mindedness, tempered with firmness and magnanimity cannot fail to pay dividends.

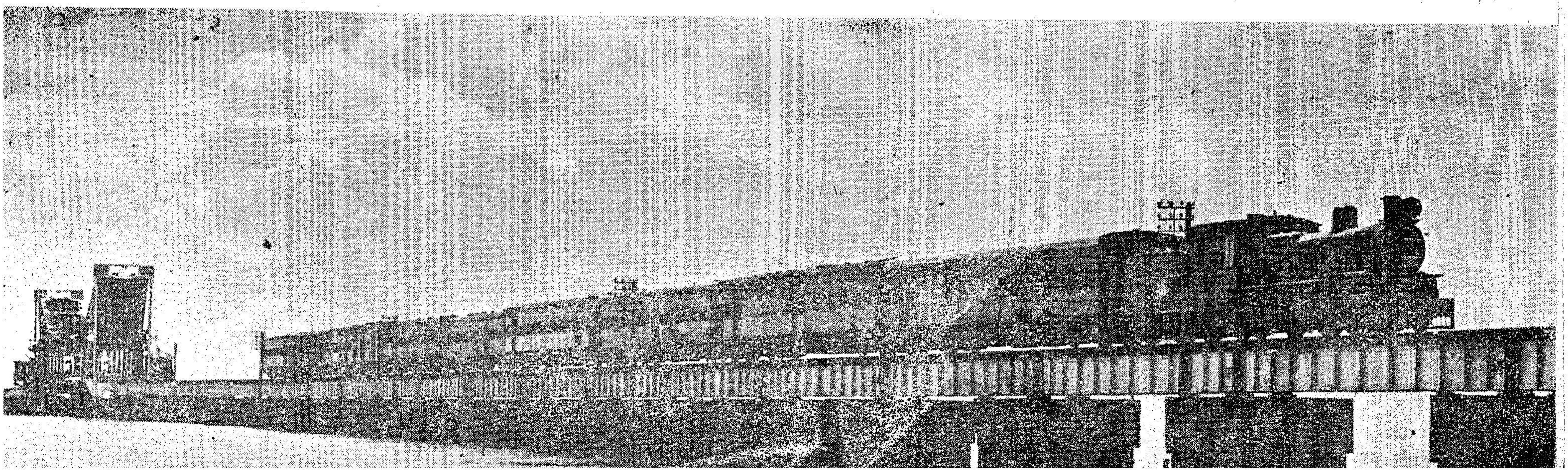
This then is the drill which each one of our Projects will have to go through. Next in the chain is the Heavy Electricals Plant at Hyderabad which is likely to be inaugurated in August next, followed by the Heavy Electric Equipment Plant at Hardwar.

The High Pressure Boiler Plant at Tiruchirappalli and the Heavy Power Equipment Plant at Hyderabad will be abiding monuments of Indo-Czech Collaboration. Likewise the Heavy Electrical Equipment Plant at Hardwar will be an added glory to the living monuments of Indo-Soviet Collaboration.

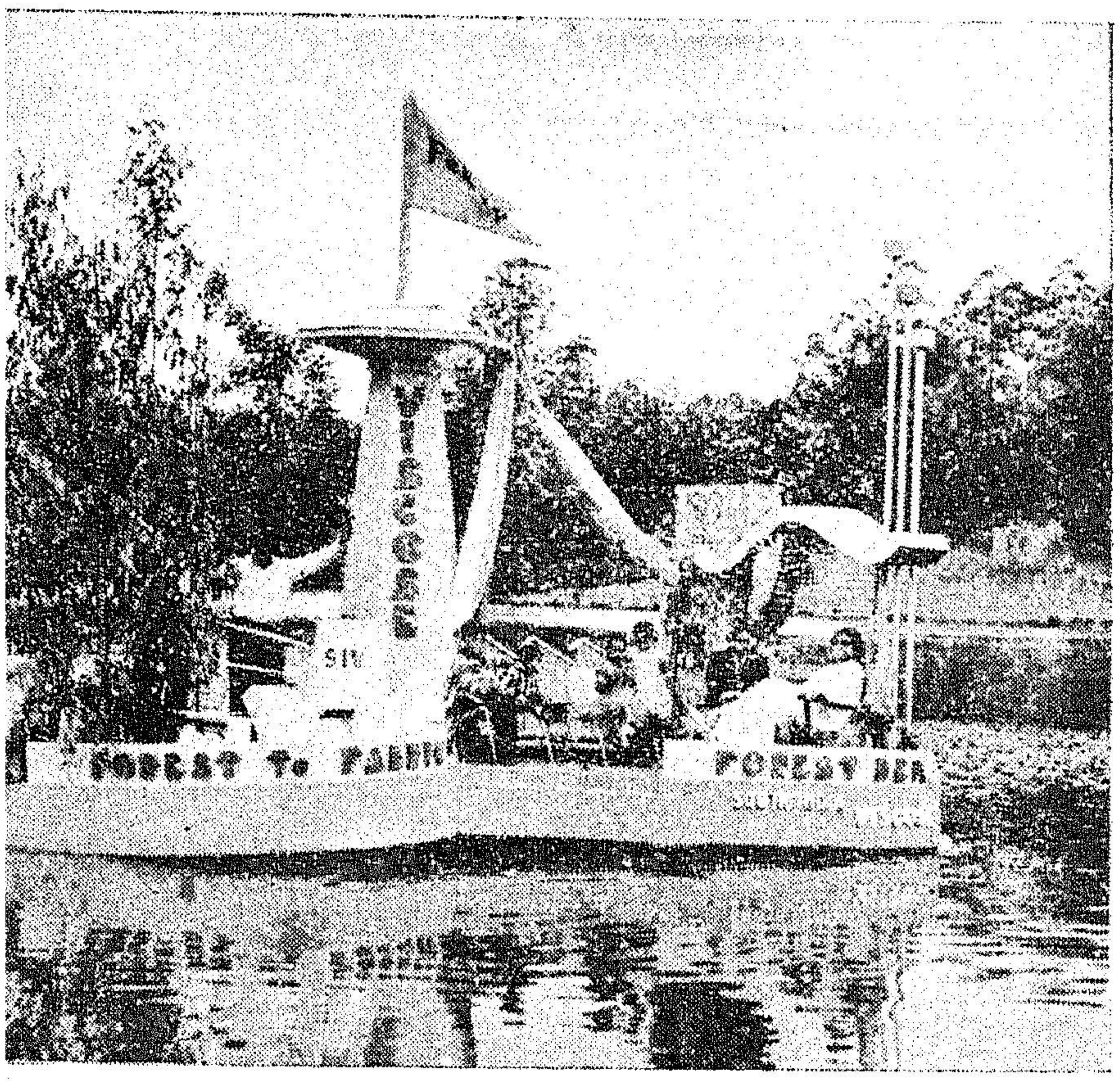
Close on the heels of the Hardwar unit, the Switch-Gear Factory at Hyderabad which is being set up with collaboration of Sweden is likely to materialise by March, 1966.

This will close the Third Plan contributions of the Bharat Heavy Electricals to the industrial potential of their country. It is our earnest endeavour that these plants where crores of national funds are being invested may turn out to be emblems of optimum productivity, efficiency and economy—a task to which every worker should address himself with dedication.

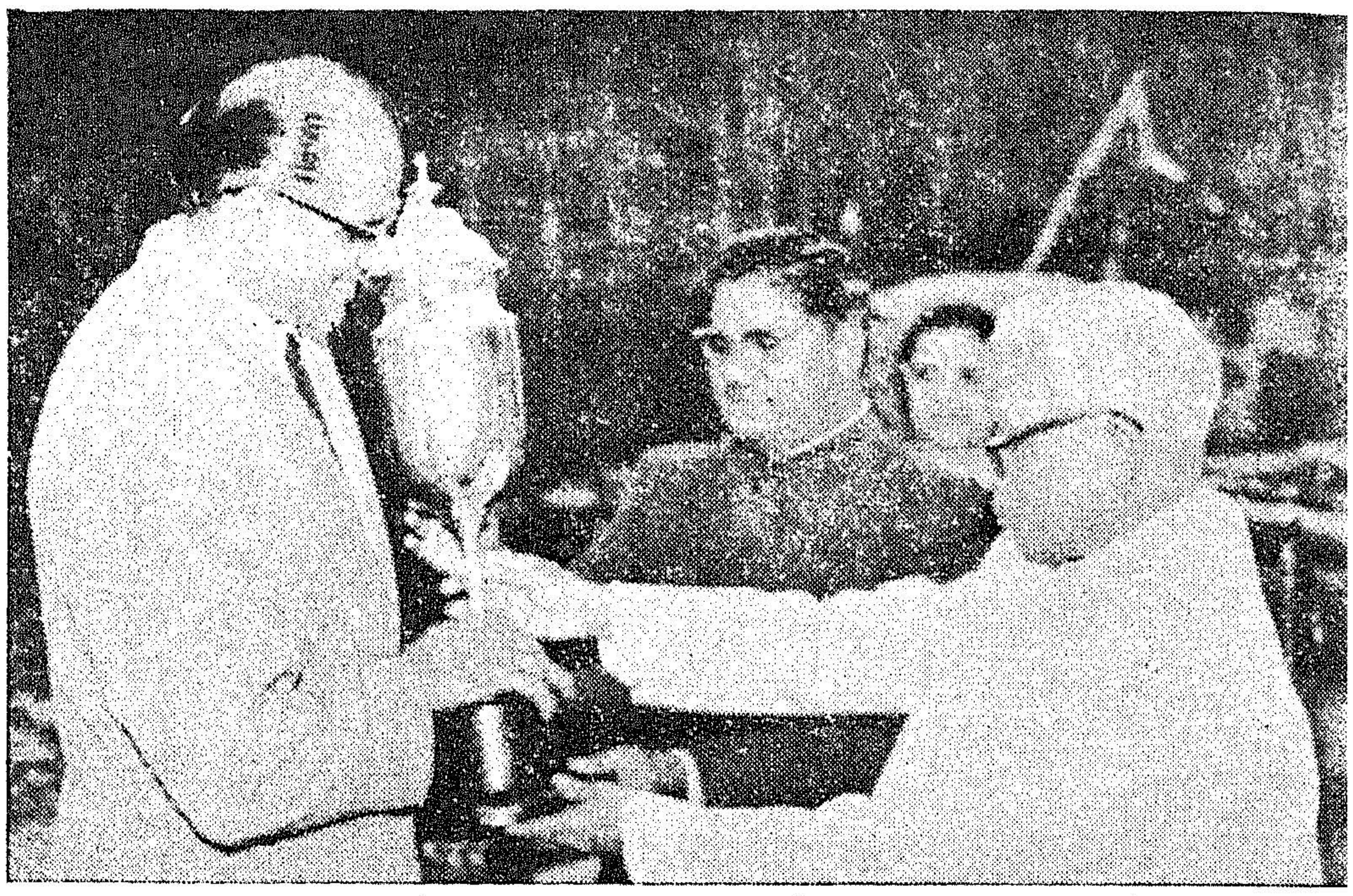
The Pamban Bridge has been reconstructed and opened for traffic in record time which was washed away by the Cyclone, which hit the Rameswaram island some months back.



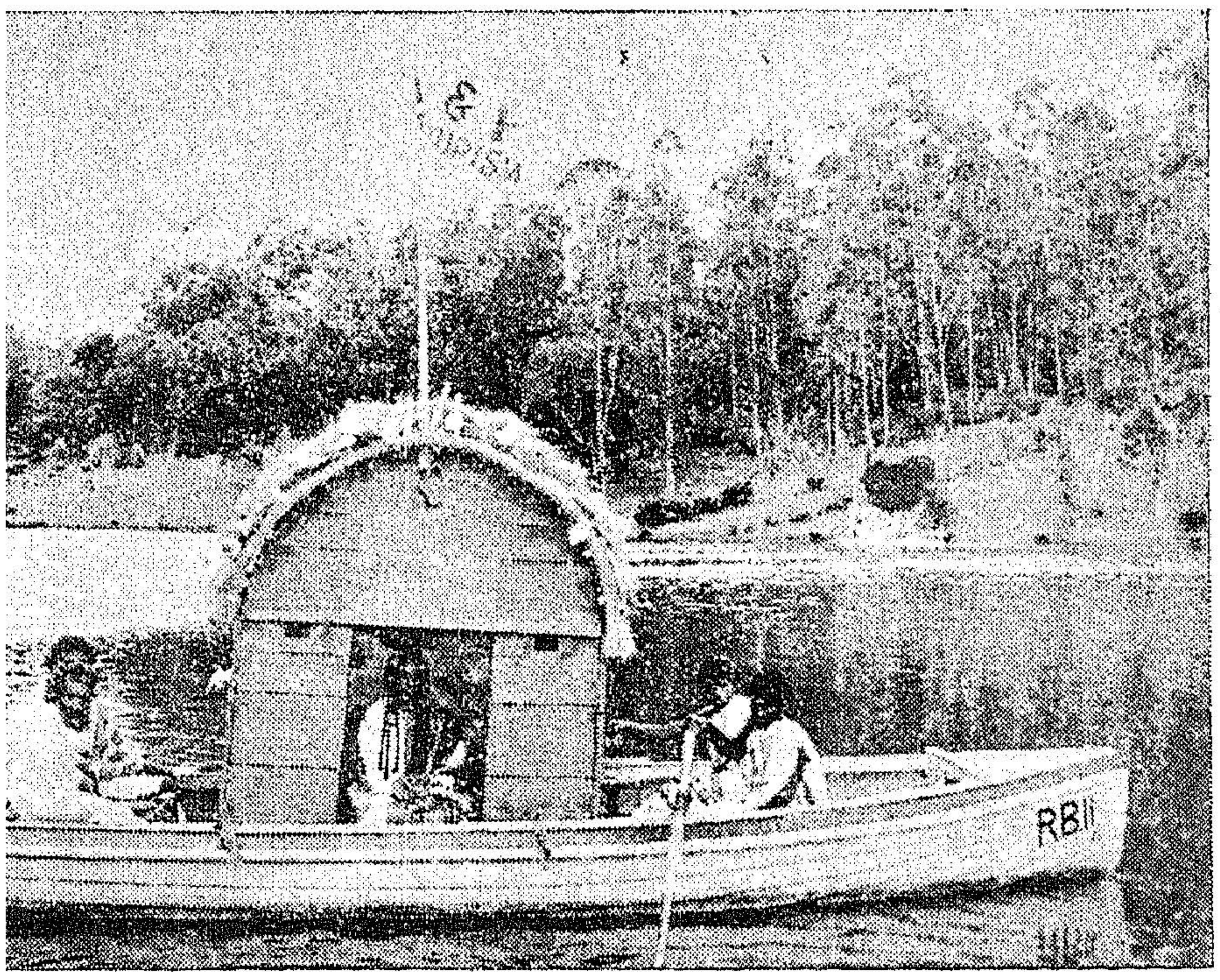
BOAT PAGEANT AND REGETTA AT OOTY



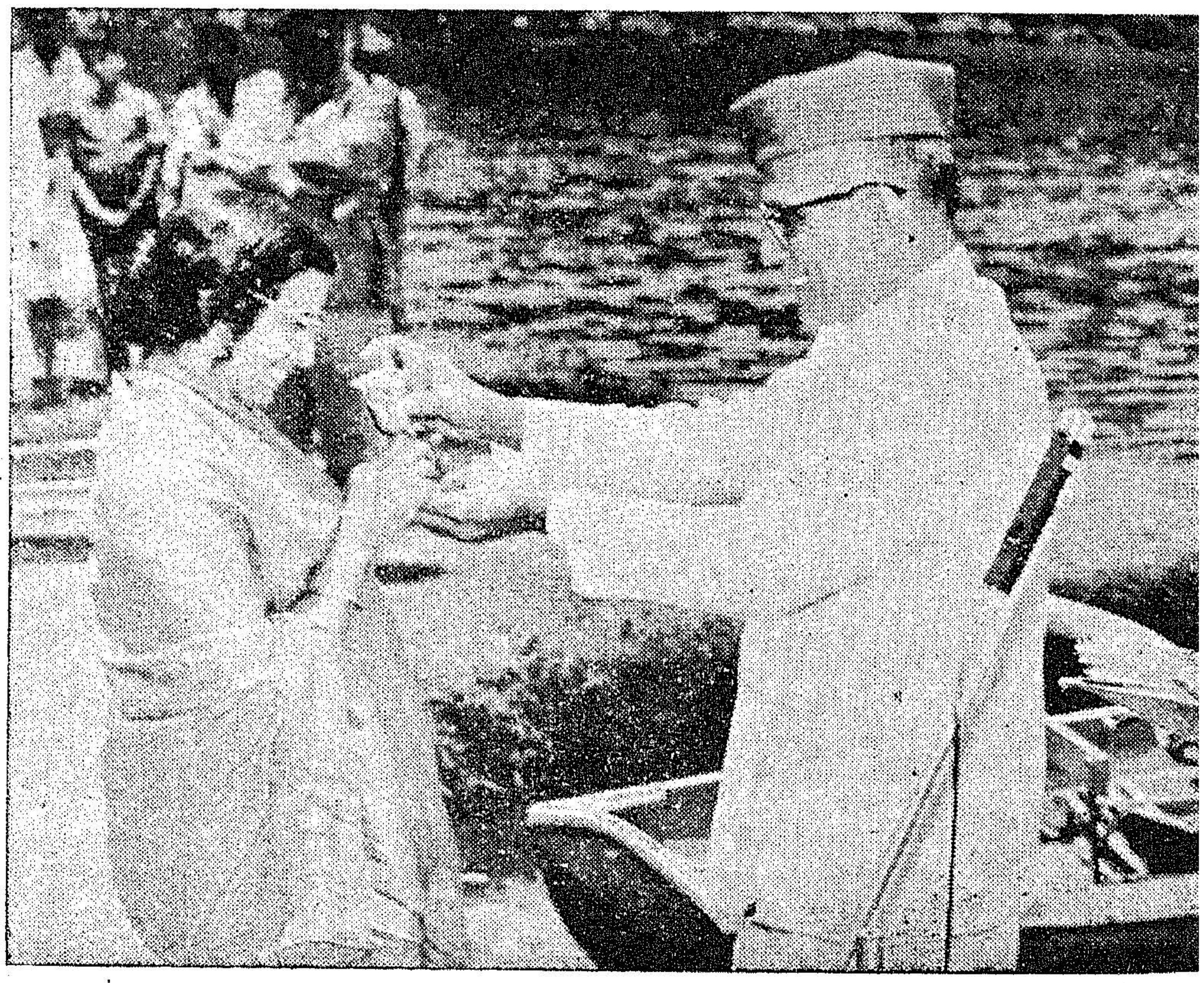
e Tableaux which won the first prize in the boat pageant
ganised by the Ooty Boat Race Committee at Ooty last month.



Chief Minister giving away prize to the best decorated boat.



One of the tableaux which participated in the procession.



Sri M. A. Manickavelu, Chairman, Legislative Council, distributing prize to the winner in the regatta held recently in Ooty.

Educating the masses in Fisheries

By V. D. SPURGEON,
Assistant Director of Fisheries (Information), Madras.

Fish as food and fishing as an occupation for man are known from time immemorial. But the value of fish in dietitics, *fish oil in* therapeutics, *fish trade in the nation's economy, use of tiny fish in controlling water carried diseases, etc., are not adequately known to masses. The utilisation of modern motorised fishing boats, modern synthetic twine fishing nets, scientific preservation of fish and the various other preservation and the tinning methods too are not fully realised by the general public. The value of the multifarious bye-products from fish that are useful for cattle, poultry and plants, the costly produce from the sea like pearl, conch, coral, ambergris, cuttle fish bone, Agar-agar, sea-weeds, etc., too are not yet fully known to the public. Still more the immense scope of co-operative enterprises in fishing and in marketing them are not fully grasped by the fisherfolk. There is therefore great need to popularise fish and its use among the public.*

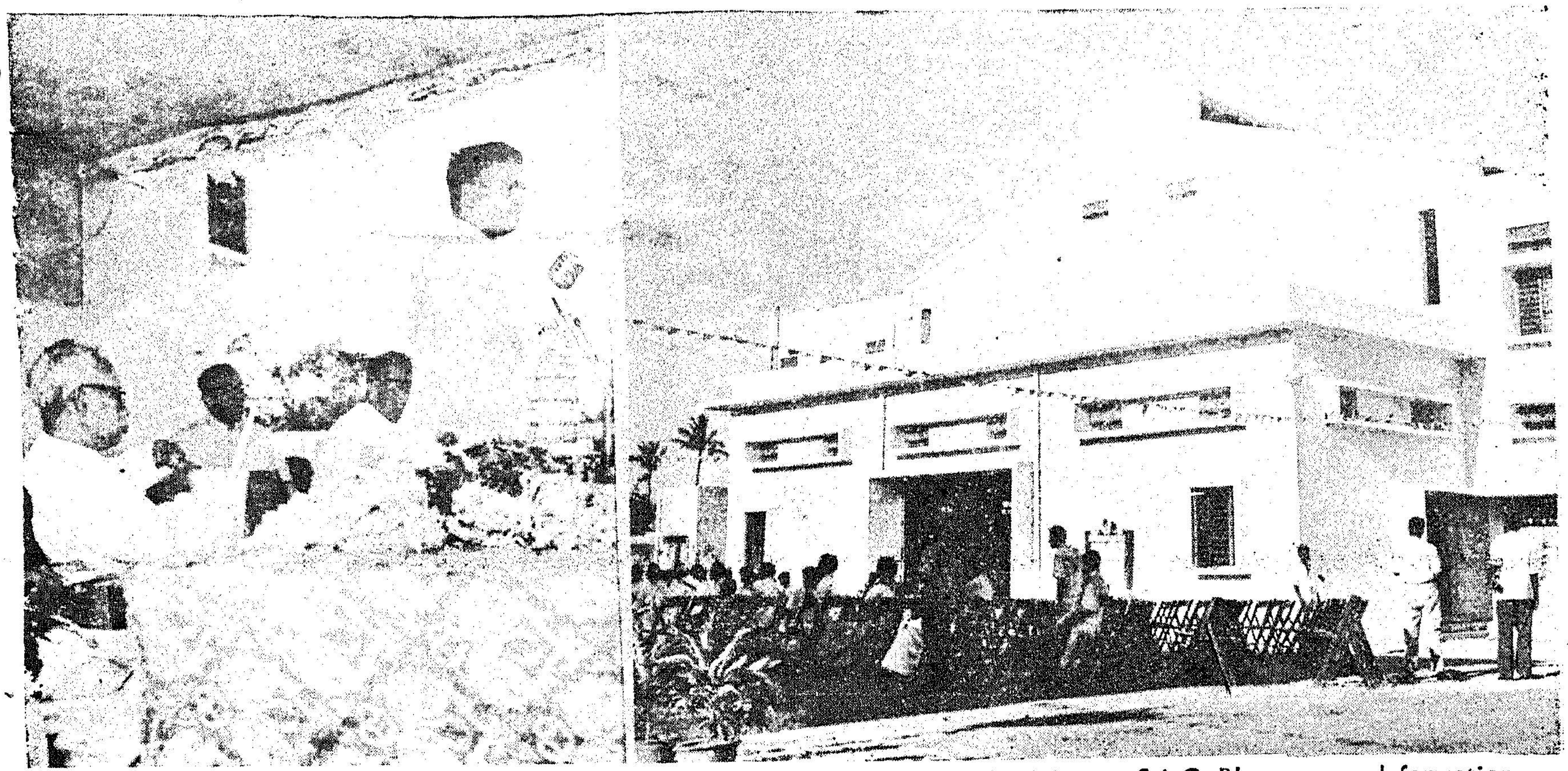
It is impossible to personally contact everyone and tell about all these things. Nor the public will be willing to stop and listen to our prosaic-platform lectures on these matters. Other methods such as audio-visual education should be taken up. The Fisheries Department is alive to this and is doing its best.

The Fisheries department has an education-*cum*-propaganda unit to evolve methods that quicken the space of fisheries education among the people. The Fisheries Education Unit is busy throughout the year evolving most appropriate and effective means for the dissemination of Fisheries knowledge.

It is realised that the masses are reluctant to learn about fisheries through books and leaflets. Therefore it became necessary for the *Propaganda*-cum-*Extension* branch of the department to take to sugar-coated subtle methods. In such methods, the necessary knowledge, ideas and instructions are made enjoyable to the audience. While enjoying the fun, frolics, music, plays, etc., the reluctant and uninformed masses can be made unconsciously to swallow the necessary information, instruction and knowledge through such shows.

These methods of education come under the caption "Audio-Visual Method of Education".

Nylon twines are being distributed by the Fisheries Department to fishermen affected by the Cyclone which ravaged the Rameswaram island recently.



Boat Building Yard at Kasimedu, Tondiarpet, was inaugurated by the Chief Minister. Sri G. Bhuvaragan, Information and Publicity Minister in-charge of Fisheries presided over the function. The latter is addressing the Gathering.

In the Audio Visual Method the vast audience are made to *see*, *hear* and *touch*. Young and old, uninformed and intelligentia all alike are eager to understand new things by seeing and hearing through the Audio-Visual Method. The various Audio - Visual Methods of instruction which are of educative value are :

1 Shows —*Temporary*—Exhibition.
Permanent—Museum, Aquarium, Sea-aquarium.
2 Films.
3 Tableaus.
4 Puppet plays.
5 Songs—Gramaphone record—Vocal or Tape recorded.
6 Dialogue-*cum*-dance recitals.
7 Radio talks and tape-recorded speeches.

These shows are of two kinds : (1) permanent and (2) occasional. Permanent educative shows are the Museum and Aquarium. The fisheries Department at present has regional museums in the office of the Assistant Directors of Fisheries and in Fisheries Research Stations at Krusadai Island, Tuticorin, Cape Comorin, Bhavanisagar, Ootacamund, Madras and Ennore.

There is a permanent aquarium of educative value in Marina, Madras. In the Western countries great emphasis is laid on Museums and are kept in all the cities. Similarly, aquariums spring up all over the globe. The sea-aquarium of Miami beach in Florida, U.S.A., is the only one of its kind, of educative value to the public about fisheries.

While museums, Aquariums, Sea-aquariums are permanently set up aids for mass education under audio-visual programmes, "Exhibitions " serve as periodical temporary educative shows. To museums and aquariums comparatively fewer number of people go as pastime. But it is in exhibitions one finds enthusiastic gatherings in large numbers in a merry mood to see and hear and study things. Therefore, exhibitions form the major plank of audiovisual education programmes in the mass propaganda and instructions on Fisheries.

Exhibition

Realising the paramount importance of the exhibitions as mass medium of education the Audio-Visual Unit of Fisheries Department participates in all the exhibitions of the State. Exhibition teaching methods are radically opposed to Text-book approach. Exhibition is "enjoy while you learn" method. By seeing, hearing and touching people learn things easily. Therefore mass education through exhibitions is accepted as one of the best methods known. Fisheries Department pavilion at the exhibition organised by the All-India Khadi and Village Industries Board at Teynampet Congress grounds from 23rd December 1964 to 4th February 1965 attracted a large number of people and every one of them appreciated it.

The salient features of the pavilion that appealed to mass are given below.

The first and foremost thing that attracted the attention of the crowd was the "Frontage" of the pavilion. For the vast crowd who are offered all sorts of attractions within the exhibition precincts, the frontage should have a compelling force and attraction revealing all at once about the pavilion to the public. Every pavilion there attempted only towards this end. But the Fisheries Pavilion was unique in that achieved great success in educating the masses in fisheries.

The pavilion was given a matter of fact frontage with a monster fish in mould and a green electrically operated flickering eye against a background of boat, net, mast and sail. The colours on the frontage were sea-blue and sea-green.

In the open space in front of the "stall" a live sea-turtle from Rameswaram was put on show in an artistic cement cistern. The turtle was made attractive for children also by giving different colour oil paint for different pieces of carapace. The turtle was docile and lent itself for handling and playing. The school children were thrilled to see it. The blind children from Teynampet School for the Blind asked me to held the turtle afloat and everyone often touched its back shield or flipper or snout and jumped with joy. The mass enquired incidentally all about turtle's use.

Various shows

The front space had a big boat mounted on a platform exhibiting modern motorised boats given to fishermen by the Department. On it a wax-model "fisherman" was made to pose with his traditional palmyrah hat and net. The inquisitive public pelted paper and paper balls on him to find out whether he is a wax model or real man. By such pranks and fun people learnt all about modern fishing craft, gear and fisherman's prosperity.

The open air front space was filled to capacity in the evenings and at night by crowds who thronged to see film shows. The films were not projected on a cloth screen as in other stalls but on a small ground glass screen imbedded in the frontage of the stall. The projector and the place from which it was projected were not seen and known to the people. They were all hidden inside the stall. The crowd could see only the pictures moving and talking. One among the crowd remarked that it was like television. The films were first projected on to a mirror inside the stall and was reflected on the imbedded glass screen. The result was of a terrific mass appeal. It was for the first time shown like that. It was unique. Films were shown continuously without a moment break with 2 projectors alternatively.

On Holidays and Sundays there were record rush to Fisheries Pavilion. On these days three Puppet Shows were shown. Between each puppet play, film shows were shown as usual. Thus film shows and puppet shows were conducted non-stop from 6-30 p.m. to 10 p.m. on holidays engaging terrific crowds with extraordinary effect.

The action of the puppets with sweet songs as prelud and interlude, with crisp dialogues about fisheries was splendid. The Health Department's staff who were trained in this art were performing the puppet shows for the Fisheries Department. The tape-recorded dialogues, songs, etc., gave the effect of puppet themselves talking and singing about Fish and its usage.

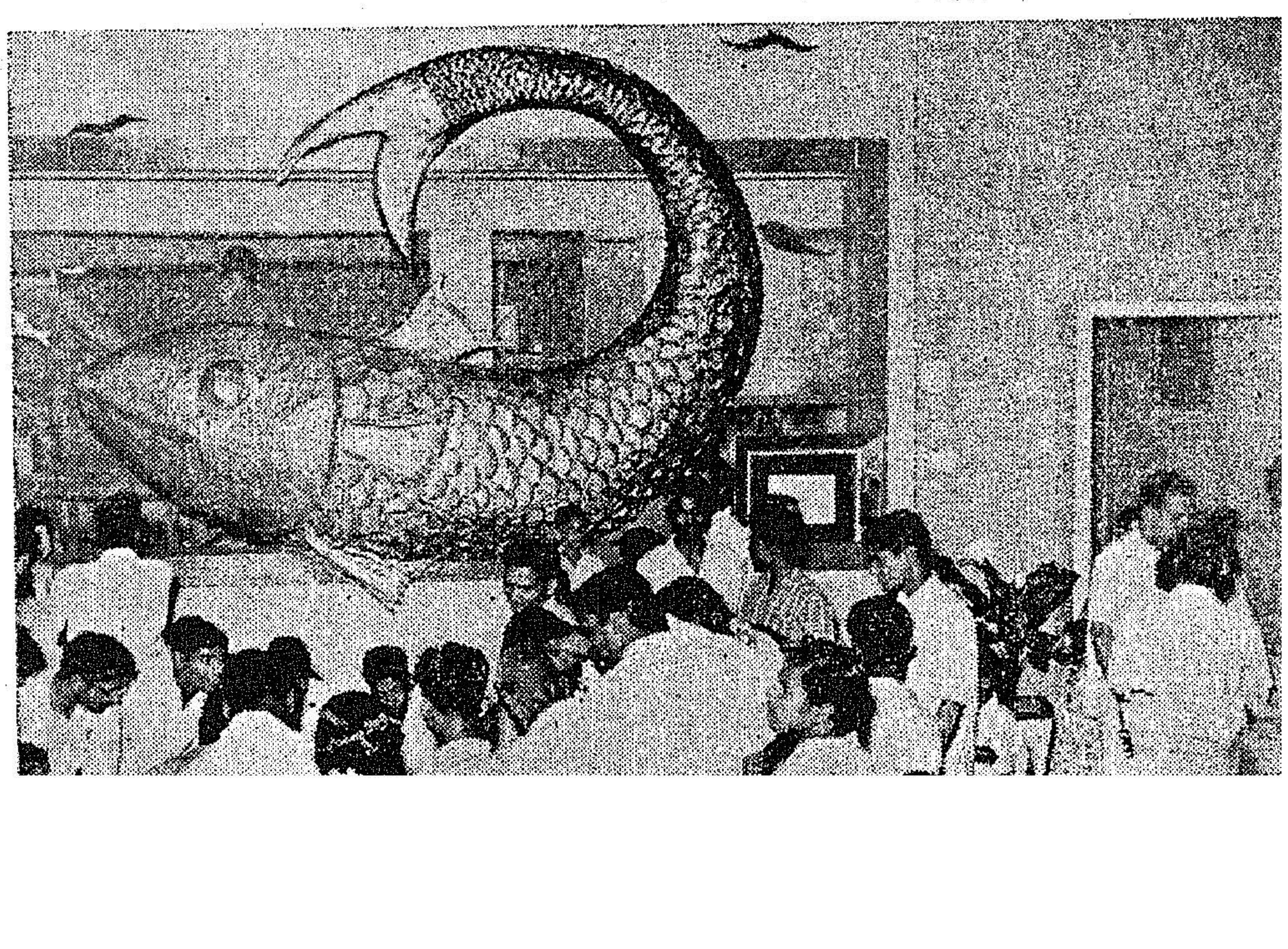
Interior arrangement

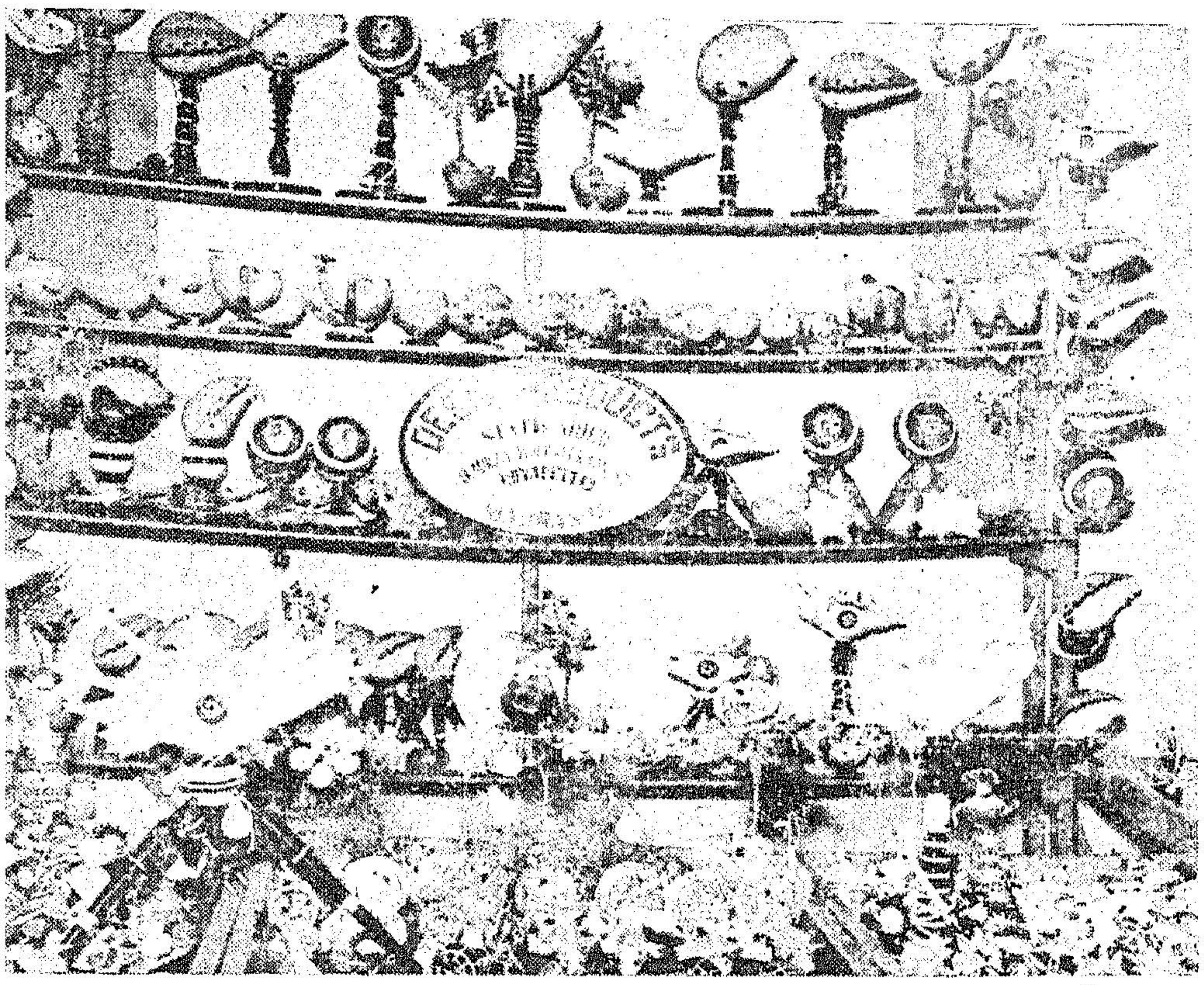
Much attention was paid equally for interior arrangements and decorations. The display of exhibits was in small compartments, galleries and on tables. There were 4 compartments measuring 4′×4′×4′ at a height of 2½′ from the floor for the visitors to see easily. These compartments were covered on three sides with paintings of boats, nets, fish and sea-bottom. In these compartments, models of nets, models of fishing crafts, model of Ooty Boat House, miniature of motors and fishery implements and bottled specimens were displayed.

In the gallery type of arrangement sea shells were displayed. All South Indian Marine Shells and dainty articles of commerce made out of myriads of marine shells were put on show. To this wing of fancy articles of shells, there was record crowd to buy every day.

The Mermaid doll seated on a sea rock after the Copenhagen model of International fame was electrically operated to move her hand as if playing on a violin.

Huge crowds at the Fisheries Pavilion at the Exhibition held recently at the Teynampet Congress grounds.





Marine Shell Products, displayed in the Fisheries Pavilion at the exhibition held at the Teynampet Congress grounds.

Tape recorded music was used giving the effect of Mermaid doll herself singing while playing on the violin and thus it attracted huge crowds.

The doll set amidst a battery of aquarium jars filled with facinating live ornamental coloured varieties of fishes gave the effect of miniature sea.

There was a live pen in which fish destroying live birds and live turtle were on show for public to see them so that they will keep them off from piscicultural project areas. There were actual electrically operated models of boat and pearl diving operations. The visitors were also invited to write their comments, recommendations, critical suggestions, etc., in a visitor's Register.

There was an enquiry counter where the public could make enquiries, elicite information and place orders for fish for their table, fish for keeping down mosquito breeding, books and literature on fisheries, shell grit for poultry, fish meal for cattle, fish for cooking. etc.

For educating public in general the "Fisheries week" was planned and celebrated in May last for the first time in the city and throughout the state by the audio—visual unit of the Fisheries Department.

ASSISTANCE FOR SANSKRIT DEVELOPMENT

The Union Ministry of Education invite applications from Voluntary Sanskrit Organizations/Institutions/Pathsalas, etc., for financial assistance during the year 1965–66 for the following purposes :—

1. Promotion of Sanskrit (Voluntary Sanskrit Organizations).
2. Publication of manuscripts/books relating to Sanskrit.
3. Sanskrit Journals.

Government of India also purchase a number of copies of books on Sanskrit of outstanding merit for free distribution to Voluntary Sanskrit Organizations.

Applications for assistance to Voluntary Sanskrit Organizations/Institutions are to be submitted through the State Government concerned, while applications under the other items may be sent direct.

Applications in the prescribed *pro forma* duly completed must reach the Ministry of Education on or before 31*st August* 1965.

Requests for application forms and rules and regulations should be addressed to Section Officer, Room No. 72, 'M' Block, Central Secretariat, New Delhi-2, mentioning clearly the object for which the form is required.

LIVING IN HARMONY

A little more than five miles from Kumbakonam, an important town in Thanjavur district of Madras State, is the small village Govindakudi with a population of over three thousand. About two-thirds of them are Hindus and nearly a thousand Muslims. Living together for years in great harmony without even so much as thinking that they belong to two distinct religious communities, untouched by the diverse pulls and pressures of modern living, including its political compulsions, these people have been able to show the way to peaceful religious co-existence. It is not that they lack amenities of modern life; these are provided in a modest way in the scheme of rapid rural development. There are good roads in and around the village, electricity and water. But these are merely secondary supports for the spirit of communal harmony that pervades the whole atmosphere. In the context of the present events in the west on the border, perhaps it is worthwhile drawing inspiration from the worthy example of Govindakudi.

The centre and symbol of this great experiment in harmonious living together is a small beautiful mosque which Dr. Zakir Husain, the Vice-President, declared open on last April 30th. Among the few mosques that are seen in the villages around—each with its own message of communal concord—the Govindakudi shrine has special significance. This is the latest among those to be constructed but what is interesting about this is that of the sum of about $2\frac{1}{2}$ lakhs which it cost, a considerable portion has come as contributions and donations from non-Muslims, particularly Hindus, and our Indian brethern abroad in places like Ceylon and Malaysia. In the very building of it, everybody in the village—irrespective of his caste, creed or religion—has put his shoulder to the wheel and made contributions in material and labour.

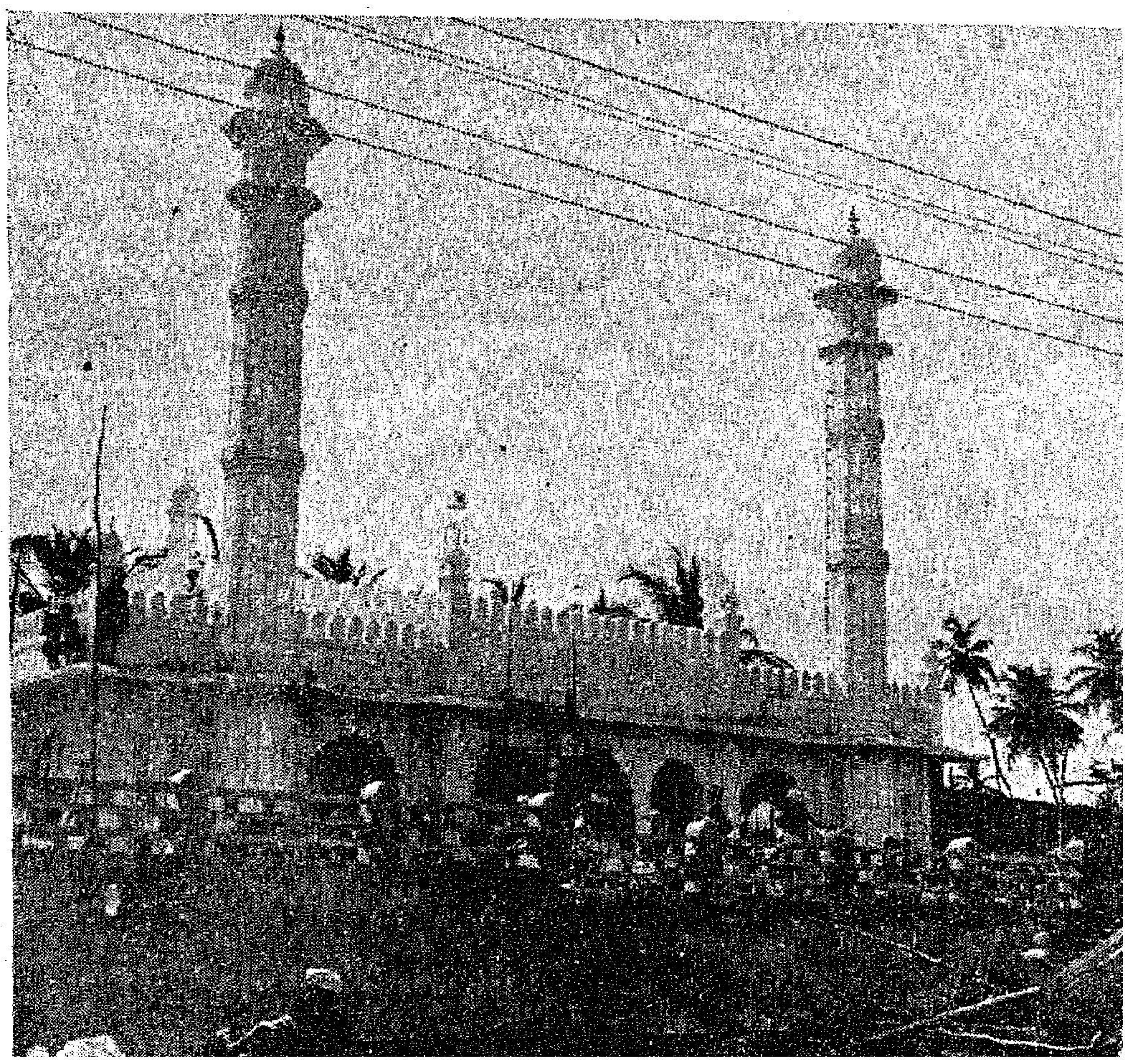
There was an old mosque here about 200 years old. As it was in an extremely dilapidated condition, the villagers decided in 1954 to construct a new one in the place of the old. Arrangements were made from that year onwards and the actual work on construction commenced in 1957. The mosque occupies a total ground area of about 5,700 squre feet., with a prayer hall of nearly 1,500 squre feet; each of the two minarets is 55 feet from the ground.

Govindakudi is a place of importance to the Hindus also, known in the legends as Gomukteswaram and Gobhaktiswaram. The place is associated with the salvation of *Kamadhenu* (the Divine Cow of Plenty), who through a lapse of memory failed to turn up at a great penance performed by Sage Vasishta. For this default, the animal had to practice severe austerities and perform penance before Lord Siva blessed it with release from the sin. A temple near abouts has for its presiding deity Lord Siva, named locally as Gomukteswara (the Lord who gave salvation to the Divine Cow).

According to historical accounts, Govindakudi is called after one of the local philanthropists and administrators of the Nayaka rule in the first two or three decades of the 17th century, Govinda Dikshita. Of all eminent men of this period, Govinda Dikshita was considered "unquestionably the most eminent". He rose from the position of the Court Priest to that of the Minister by sheer ability.

It is of interest to note that the day following the inauguration of the mosque by the Vice-President, is an important day for the temple. Special religious significance attaches to the New Moon Day which occurs towards the end of April or early in May (corresponding to the Tamil month of Chaitra).

A view of the mosque at Govindakudi about five miles from Kumbakonam (Madras State) which was declared open by the Vice-President, Dr. Zakir Hussain on April 30, 1965.



THE army CADET COLLEGE

It is said of Napoleon's Army that every soldier carried the Field Marshal's baton in his knapsack. This meant that given the time, the opportunity and the training every soldier could blossom into an efficient Army officer. This is being done at the Army Cadet College in Poona. Here selected Other Ranks of the Army undergo intensive training for entry into the Indian Military Academy and then into the coveted ranks of Army Officers.

In the pre-war days, military training was imparted at the Kitchner College, Nowgong (Madhya Pradesh). Therefore it was only fitting that the Army Cadet College was opened at Nowgong in 1960. Initially the capacity of the college was 45 cadets but within three years it reached the target of 230. Selected other ranks of the Army were trained at the college for one year after which they were screened by the Services Selection Board. The successful cadets then entered the Indian Military Academy, Dehra Dun, for pre-commission training.

After the emergency, an intensive effort was made to tap all the available resources and select the best talent for filling the officer cadre in the Armed Forces. Naturally the training programme of the Army Cadet College was also changed to make it more broad-based so that the jawans got greater opportunity to join the officer cadre. This was not only to their advantage but also of benefit to the country. In the light of experience and considering the future requirements, the aim and scope of training at this institution was modified.

It was decided to increase the strength of the college gradually to 650. Recently the strength has been finalised at 480. All cadets before joining the college have now to appear before the Services Selection Board. This prior screening eliminates wastage inherent in the previous system under which the cadets appeared before the Board only after completion of training at the college. The duration of training was increased from one year to eighteen months. The entry into the college was made bi-annual, in January and July, to coincide with the entry into the Indian Military Academy. The college was shifted last year to Poona.

The minimum educational qualification for entry into the college continued to be matriculation or its equivalent. But it was decided to accept candidates in possession of the Army First Class Certificate of Education with First Class English Certificate. They, however, have to put in six months of extra training and have to pass the Army Special Certificate of Education before starting the normal eighteen months' course at the Army Cadet College. The age-limits for entry were revised and jawans now being admitted are

between 19½ and 24 years of age. The revision gave greater opportunities to the jawans, ensured the best selection and cut down wastage.

Curriculum

The training programme at the college is divided into three terms of six months each. At the end of each term the cadets have a vacation. They also have a three-day break in the middle of each term. The curriculum includes English, Hindi, Science, Mathematics, Geography, History, General Knowledge and Current Affairs and Citizenship. After physical training and drill, Academic classes begin every morning and continue till the lunch hour. The afternoons are devoted to hobbies or tutorial classes. The service subjects taught at the college are map reading, physical training, drill, military writing and public speaking, outdoor work and camps. They are also trained in general behaviour, mess etiquette and dress, so that they know the correct dress and behaviour for various occasions.

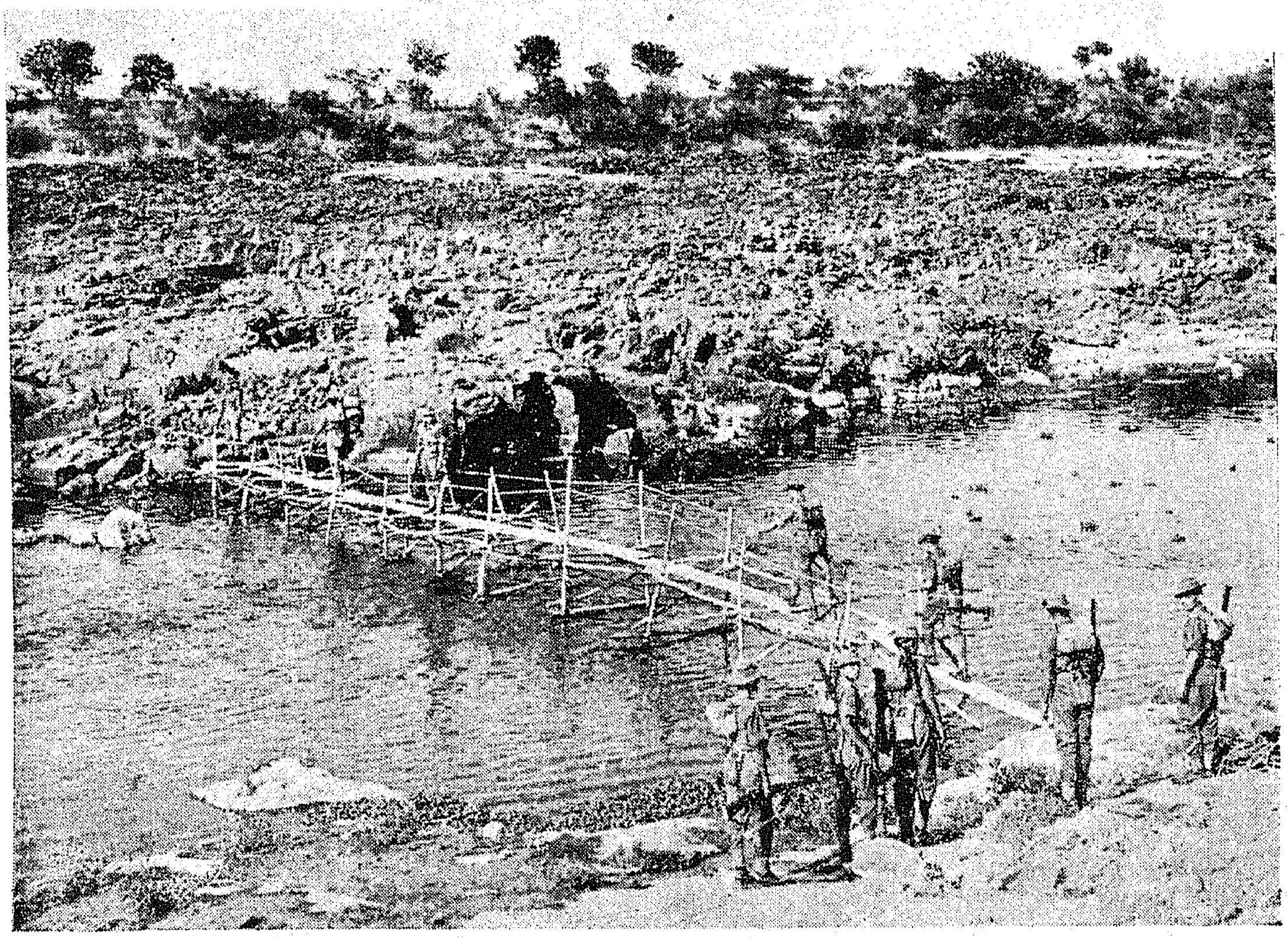
Apart from the above training, great emphasis is laid on the development of the cadets' personality and infusing in them qualities of leadership, courage, character and a high sense of duty, loyalty, integrity and discipline. The training curriculum at the college has been re-orientated with emphasis on outward bound training. The cadets undertake rafting, bridging, rock climbing and go on hikes where they live in the open camps for several days entirely on their own so as to instil in them a love of adventure, the ability to improvise

Great emphasis is being laid on cutward bound training at the Army Cadet College in Poona, where selected Jawans are trained to become officers. Photograph shows a group of Cadets resting near biouvacs made by them with ground sheets and sticks for staying in the open.

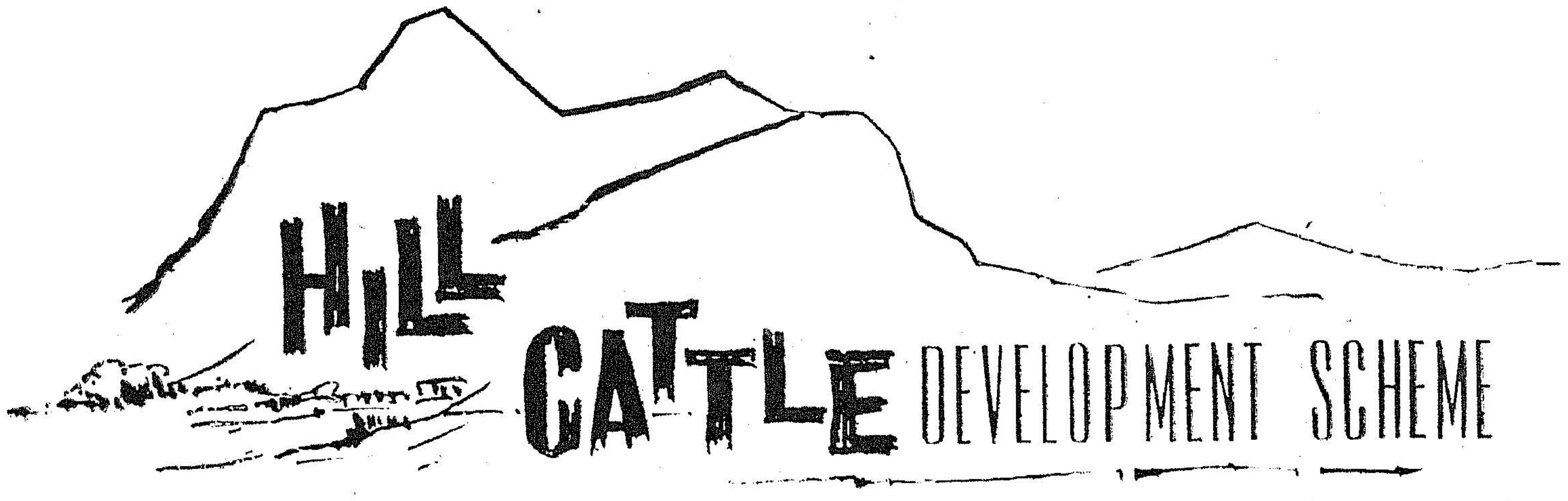
and a habit of taking correct decisions quickly. This outward bound training toughens the cadets and is of particular importance in the context of the military life to-day when officers and men of our Army have to live and work in the forward areas in the Himalayas at high altitudes and in bitter cold.

The college also encourages extra-curricular activities to add lustre to the personality of the cadet, widen his horizon and to provide him with useful hobbies. They are taken on visits to historical places, are encouraged to join the hobby clubs—of which the college has more than a dozen—to participate in sports and tournaments and in the social activities at the college.

At the end of his training the cadet has to pass an external examination in Academics and prove himself worthy of joining the Indian Military Academy, Dehra Dun, for further pre-commission training.



Cadets are seen here in full kit crossing a bridge made of sticks and ropes built by them across a stream.



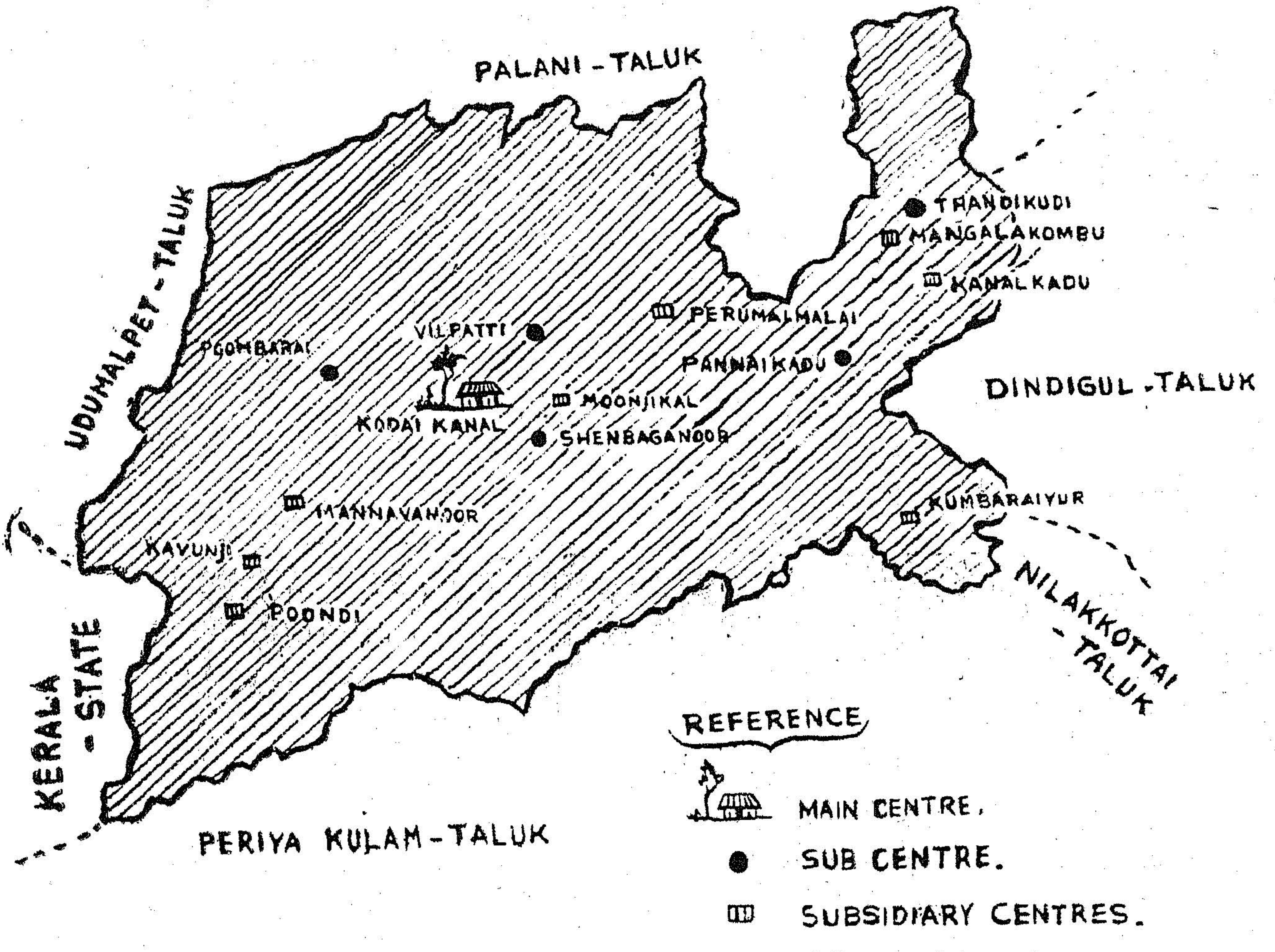
HILL CATTLE DEVELOPMENT SCHEME

DR. I. D. MANTRAMURTI, G.M.V.C., B.V.SC.,
Director of Animal Husbandry, Madras.

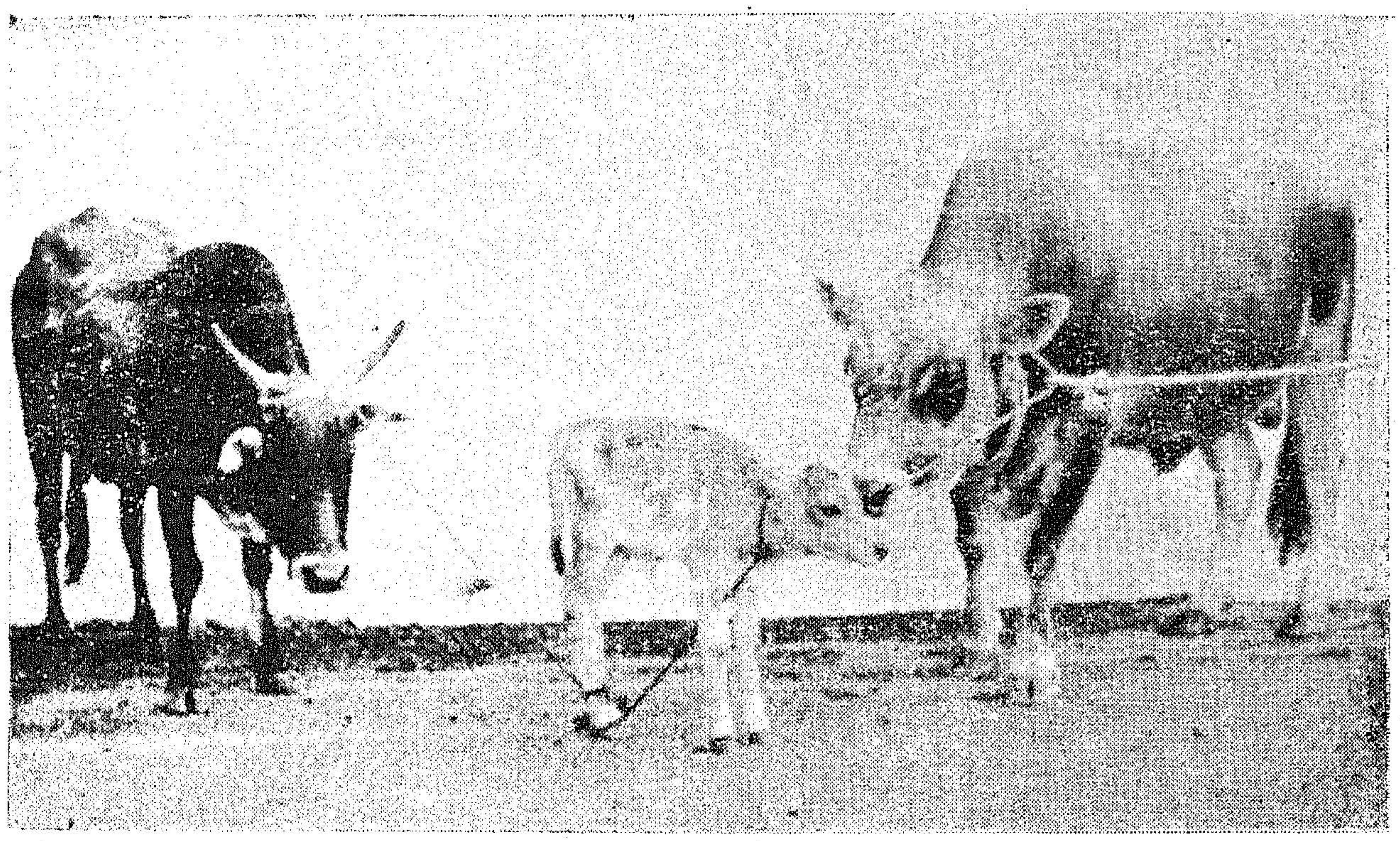
A hill cattle development scheme was inaugurated in July 1963 *in the Kodaikanal taluk of the Madurai district with a view to increase milk production in this area by developing good breeds of milk cattle. The whole taluk has now been covered by the scheme.*

Of the basic nutritional needs of mankind, milk occupies a very important place, but in Madras State the *per captia* consumption is only about three ounces per head as against the minimum necessity of ten ounces. It is still less in the hilly regions of the South like Kodaikanal. The main reason for this condition is that the milk yileds of the cows and buffaloes in these areas are very low. The hill cattle do not belong to any descriptive milch breed. Scientific methods are not followed in these regions in breeding, feeding and management of these animals. They are maintained more for manure and labour than for milk. The number of cows and she-buffaloes maintained for production of milk only is low when compared to the other regions of this State and so the total milk produced is also low. The heavy rainfall, high altitude and climatic conditions prevailing in these regions also attribute to the low production and intake of milk. Calcium deficiency is commonly noticed in these hilly regions and this causes the animal to become weaker and produce less. The demand for milk is also great in these regions.

KODAIKANAL TALUK MAP



HILL CATTLE DEVELOPMENT SCHEME, KODAIKANAL



Superior milch breeds are being used to develop good milking cows in the Kodaikanal hill area.

To counteract this tendency and to bring about an increase in the milk production in the hilly region by using superior milch breeds like Jersey which thrive well in the prevailing conditions, the Government of India has formulated a scheme and among the centres selected Kodaikanal of Madurai district is one where the scheme is run with 100 per cent aid from the Central Government.

This scheme which was started in July 1963 covers an area consisting of 5,326 breedable age cows of cross-bred and non-descript type in Kodaikanal taluk. Five sub-centres and eight subsidiary centres are located under this scheme in the following places with the Main Centre at Kodaikanal. The Main Centre is at present located in the Veterinary Hospital, Kodaikanal. Buildings for the scheme are coming up and are expected to be completed within a year.

Name of the sub-centres.	*Name of the subsidiary centres.*
(1)	(2)
1 Shenbaganur	1 Perumalmalai.
	2 Moonjikal.
2 Pannaikadu	3 Kumbaraiyur.
3 Thandikudi ..	4 Mangalakombu.
	5 Kanalkadu.
4 Poombarai	6 Kavunji.
	7 Poondi.
	8 Mannavanur.
5 Vilpatty	....

Two Jersey Bulls are in the Main Centre at Kodaikanal. To improve the buffaloes which are 873 (breedable age) in number two Murrah Buffalo Bulls are also located at the Main Centre, Kodaikanal, at State cost.

Previously semen collected at the Main Centre, Kodaikanal, was distributed to the sub-centres on every third day through messengers. After the receipt of Jeep during September 1964, it is being distributed effectively through this quick conveyance. There are five-refrigerators, one in each of the above five sub-centres for storing semen. From here semen is sent to the various subsidiary centres through messengers every day in thermos flasks after examination.

There is one Veterinary Assistant Surgeon with one Livestock Assistant at the Main Centre, Kodaikanal, and two Livestock Assistants at each of the sub and subsidiary centres. Five messengers located in the five sub-centres attend to the transport of semen besides attending to sub-centres whenever it is possible.

The staff posted here have visited all the villages and completed the survey work. Preventive inoculation and tattooing work have been undertaken. 3,464 animals were protected during 1963–64 against Black-quarter and Haemorrhagic Septicaemia, the two common diseases that affect animals every year. During 1963, 315 Scrub Bulls have also been castrated. These institutions besides doing breeding work act as first-aid centres and all minor ailments are attended to.

There is poor response in the villages due to illiteracy and the time honoured custom of keeping cattle mainly for manure purposes. That is now being changed slowly but steadily by propaganda and persuasion by the Staff of the Animal Husbandry Department, Madras. Some calves have come up already to the Jersey Bull during August 1964. It is hoped that they will take it up gradually and produce good milking cows within a couple of years when Kodaikanal Hills can become a good milk pocket and export milk to big cities like Madurai and Madras.